SHAPING TASKS AND RELATIONSHIPS AT WORK: EXAMINING THE ANTECEDENTS AND CONSEQUENCES OF EMPLOYEE JOB CRAFTING

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This dissertation explores job crafting, or the processes through which individuals conceptualize and carry out tasks, enact relationships with others to get work done, and ascribe meaning and significance to their jobs. Previous literature in this area has remained relatively silent about the work context factors shaping job crafting. Thus, the research conducted in this dissertation addresses three primary questions: (1) *What does it mean to craft a job?*; (2) *What are the effects of the structural and relational context of work on job crafting?*; and (3) *What are the outcomes of job crafting?* A model of individual job crafting and its antecedents and consequences is proposed, to describe how the structural and relational contexts of work shape opportunities and motivations to engage in job crafting. The research model explores the influence of discretion in work, task complexity, and task interdependence with others, as well as the influence of workgroup psychological safety and occupational community of practice, on how individuals craft their jobs. Further, outcomes of job crafting for individuals as well as the collective (workgroup and organization) are also explored.

Job crafting is examined empirically in two settings that facilitate observation of job crafting because they offer individuals high opportunities to craft work (Eisenhardt, 1989), and provide different lenses that complement each other in enriching our understanding of job crafting. Study one (manufacturing work) preliminarily explores job crafting in autonomous teams in a manufacturing organization - the Volvo Uddevalla car factory in Sweden, where considerable room is deliberately left for individual input. Study two (service work) affords a richer context to explore the content of job

crafting and in particular, the organizational and collective influences on job crafting. This study surveyed special education professionals – an occupation where there is no "right way" to do the work – in a sample of 200 schools from a large urban public school district in the U.S. Based on extensive qualitative work, a rich measure of job crafting was developed.

The findings suggest that work discretion, task complexity, and interdependence with others enable job crafting behaviors. The positive effect of work discretion on task crafting is stronger for individuals with broader skills than for those with narrower skills. With regard to collective influences, team psychological safety inhibits individuals' job crafting. Further, the positive effects of the occupational community of practice on job crafting are stronger in organizational settings emphasizing collaborative work than in those emphasizing isolated work. With regard to outcomes, individual job crafting enhances employees' job satisfaction and commitment levels, while increasing individual performance and reducing absenteeism levels. In addition, the effects of individual job crafting extend beyond the individual and positively impact team outcomes. Finally, implications of findings for researchers and practitioners are also discussed.

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1.0 INTRODUCTION

In recent years, employers have been facing increased competitive pressures to attract and retain talent (Cappelli, 2000), and increased worker expectations to have a voice in shaping their work experiences (Freeman & Rogers, 1999; Rousseau, 2005). Research suggests that giving workers a say in shaping their work experiences leads to behaviors such as being proactive and innovative, cooperating in teams, and sharing knowledge with others at work, which have been shown to be an important driver of organizational performance (Morrison & Phelps, 1999; Crant, 2000; Hansen, 1999; Nahapiet & Ghoshal, 1998; Tsai & Ghoshal, 1998).

Further, in many cases, employees have come to question the meaningfulness of their work -- as organizations are "dejobbing", employees are seeking "more than a job" (Bishop, 1999). Many workers search for more meaningful, satisfying work that is necessary for the functioning of their organization and of the wider world (Wrzesniewski, 2003; Pratt & Ashforth, 2003). Recent evidence suggests that the search of an identity at work may influence many of the behaviors so ught by employers, such as people's cooperation with others and their level of involvement in work (Milton & Westphal, 2005). In this way, workers can imbue their work with increased meaningfulness not necessarily through the kind of work they do, but more importantly through their relationship to their work and with others at work.

These changes in the dynamic of work suggest that there is potential for a new research lens to explore how work in organizations reflects the decisions of people carrying out that work. Traditionally, the relationship between an individual and her job has been viewed through a job design perspective (Hackman & Oldham, 1975, 1976, 1980). Organizational behavior scholars have long been interested in how job design influences individual satisfaction and commitment, as well as individual and

organizational effectiveness. Nevertheless, there is little research examining how and why people *take action themselves to shape their jobs* in ways that fit better their interests, skills, and motivation at work.

Describing work through formal job descriptions misses important employee-initiated behaviors that reflect unique ways in which different employees enact their work. As Barley and his colleagues suggested (Barley, 1996; Barley & Kunda, 2001), organizational researchers need to attend to work in more nuanced ways and view work as an interconnected set of processes and relationships that extend over the more traditionally defined boundaries of a job and that involve multiple actors and social collectives.

More recently, organizational researchers have begun to take a broader view of the individual-job relationship, one that reverses the direction of this relationship from one in which individuals fit previously defined jobs to one in which individuals take a more active role in shaping the boundaries of their jobs. This new lens, called "job crafting" (Wrzesniewski & Dutton, 2001), is a theoretical shift in organizational literature that reflects the increasing value that researchers place on the role of individuals in "crafting" new ways of approaching work (Staw & Boettger, 1990; Orr, 1996). This approach recognizes that individuals, even in the most routine jobs, capitalize on their uniqueness by differentiating themselves from their coworkers in the way they do their jobs. The fundamental implication of adopting this approach is that performance is viewed now more as a function of *what individuals actually do* in their jobs and less as a function of *how jobs are designed*, therefore emphasizing the active role of the individual in shaping performance outcomes.

1.1 PROBLEM STATEMENT

Work in organizations gets done in ways that are often different from any job descriptions, manuals, or training programs. Indeed, workplaces have been described by scholars as arenas that structure action (Darrah, 1992; 1994) and where individuals enact work practice as a result of a "reflective manipulation of a set of resources accumulated through experience, with the range of manipulation neither totally free

nor constrained to the original manifestation of any element" (Orr, 1990: 184). Despite the fact that individuals often craft their jobs in different ways based on individual interpretations, interests, skills, and initiative, most studies of work have focused on work as the employment relationship, and have ignored the actual work practice, or what people actually do in their jobs (Orr, 1996). The implicit assumption of previous studies was that work in most organizational settings is done according to written manuals or training programs, and that there is a specific, prescribed way in which work is undertaken.

As suggested earlier, some organizational scholars have called for more studies of work that open up the "black box" of work by exploring how people actually carry out their jobs in organizations (Barley, 1990; Barley & Kunda, 2001; Darrah, 1992). A job crafting perspective on work answers these calls by exploring how individuals in organizations engage in the actual work practice that may differ in significant ways from the espoused practice. In this dissertation, I adopt a job crafting lens on the relationship between individuals and their jobs. Further, I explore multiple facets of this relationship – tasks, relationships with others at work, and meanings of work. More specifically, I focus on the active role of individuals in conceptualizing and rethinking their tasks, enacting relationships with others to carry out their work, and ascribing meaning and significance to the work they do.

Consider the job of a hospital nurse as an illustration of job crafting. The formally described job of the nurse includes making patient diagnoses, administering medication, doing intravenous work, taking specimens, giving treatments, feeding the patient, moving the patient and helping the patient to achieve physical comfort, taking care of the patient's personal hygiene, filling administrative forms, and so forth. However, in doing her job, the nurse may also perform additional activities not formally included in her job description, such as initiate conversations with the patient and family members to establish relationships and get more contextual information, provide detailed instructions for home care when the patient is discharged, communicate information to the patient from others, or communicate seemingly unimportant information about the patient, which may be critical to the care process, to others in the care team. In our example, one nurse may limit her work to the minimum tasks and relationships required in her job. Another nurse may add other tasks and engage in more relationships, as described above, to do

her work, therefore crafting the tasks, relationships, and the cognitive meaning of her job. Because the latter nurse in our example adds significant patient-related communication and care work to her formal job, she also changes the meaning and significance of her work from one of "providing high-quality technical care" to "providing patient advocacy and total care".

Individuals may shape the *task boundaries* of their jobs by taking on more tasks than what their jobs require, by altering the sequence of tasks to accomplish work, or by introducing new task routines that differ from how others perform similar jobs. They may also shape the *relational boundaries* of their jobs by altering with whom they interact at work, how frequently they interact with these individuals, and how close they feel to these people. Finally, individuals may also shape the *cognitive boundaries* of their jobs by viewing their jobs as taking a different significance or meaning from what the job is generally perceived by others.

Contrasting job crafting to job design (Hackman & Oldham, 1976, 1980) and social-information processing (Salancik & Pfeffer, 1978) approaches, Wrzesniewski and Dutton (2001) emphasized the idea that how individuals perform their jobs is not a passive reaction to the design of work or to coworkers' social cues about work, but is to a great extent a function of the individual performing that job. As opposed to job design where job elements that compose the job are externally determined, job crafting adopts the view that job elements are internally shaped by individuals' behaviors. As opposed to the social-information processing view where individuals are seen as simply interpreting and reacting to cues from the social context at work, job crafting views individuals as enacting their jobs in ways that reflect individual preferences and understandings.

Prior research suggests that individual differences may shape employees' motivations to craft their jobs. Employees with intrinsic motivations (e.g., doing the work for reasons residing in the work itself) may be more likely to engage in expansive job crafting compared to people with extrinsic motivations (e.g., doing the work for reasons outside the work itself), to express their competence and self-determination at work (Amabile et al., 1994; Wrzesniewski & Dutton, 2001). Further, employees with a calling orientation toward work (e.g., those who focus in their work on enjoyment or fulfilling and

socially-useful work) may be more willing to craft their jobs than those with a job orientation (e.g., those who focus on financial rewards in their work; Wrzesniewski, McCauley, Rozin, & Schwartz, 1997). Similarly, when individuals have a higher need for uniqueness or distinctiveness from others (Snyder & Fromkin, 1980), they will be more likely to craft their jobs to be different from their coworkers. Finally, individuals with a higher need for relatedness (Baumeister & Leary, 1995) may also be more likely to craft their jobs in a way that allows them to connect with others at work in more meaningful ways. These areas of research suggest that individuals with certain work orientations, motivational orientations, or needs will be more likely to craft their work.

However, whether individuals succeed in the pursuit of these needs is dependent on the work contexts in which they act (Ryan & Deci, 2000). Further, besides selecting employees with certain motivations or needs, what other resources do managers have for fostering job crafting behaviors that serve both organizational goals and individuals' needs to do work that fits better their interests, motivations, and conceptions about work? Understanding how work contexts affect job crafting behaviors can help individuals and organizations in shaping agentic behaviors rather than selecting those individuals with certain motivations at work. There is little prior research that has examined the role of work contexts in shaping individuals' job crafting behaviors in organizations. What we still need to understand is what in the context of work cultivates individuals' job crafting behaviors. If these behaviors are not prescribed by the job, what context factors make some individuals "craft" their jobs more than others? Further, we need to learn more about the implications of job crafting for individuals, and how it influences the workgroups and organizations in which individuals are embedded.

1.2 RESEARCH QUESTIONS

This dissertation addresses three primary questions: (1) What does it mean to craft a job? (2) What is the effect of the context of work on job crafting? and (3) What are the consequences of job crafting? Drawing on literature on various related conceptualizations of how employees shape their jobs (e.g., task revision,

Staw & Boettger, 1990) and on how collectives influence job crafting processes (e.g., work groups, Moreland & Levine, 2001; communities of practice, Orr, 1996; Lave & Wenger, 1991; Brown & Duguid, 2001), I hypothesize that job crafting is a function of several structural and relational factors in the work context. In addition, I explore the individual outcomes associated with job crafting, and the implications for workgroup and organizational outcomes.

Research question 1: What does it mean to craft a job? It seems intriguing that even in very routine jobs we see so much variety in the way people enact their jobs. For example, Wrzesniewski and Dutton (2001) documented how hospital cleaners, even though they had the same prescribed job at the same hospital, crafted their work very differently in terms of the meaning of work as cleaners versus helpers of those sick, the content of tasks they performed, and the nature of relationships they established at work, ranging from the minimum of necessary tasks and relationships to carry out their jobs to additional tasks and interactions with patients and visitors, beyond what their jobs prescribed. Other scholars have documented in ethnographic work how copy machine technicians (Orr, 1996), emergency medical technicians (Nelsen, 1997), cooks (Fine, 1996), design engineers (Fletcher, 1998), computer-supported collaborative work technicians (Star & Strauss, 1999), and nurses (Jacques, 1993) craft their jobs in ways that differ from the way outsiders think about or perceive these jobs.

Several approaches in the organizational literature have captured the idea that individuals may engage in crafting new elements of their jobs. Although there may be some overlap between the concept of job crafting and these prior conceptualizations, none of them captures the essence and the multi-faceted aspect of job crafting. The idea that individuals can engage in role innovation by exercising latitude with respect to the activities, methods, and style in one's role originates in the role making (Katz & Kahn, 1966; Dansereau, Graen, & Haga, 1975; Graen, 1976) and organizational socialization (Van Maanen & Schein, 1979) literatures. Researchers in these traditions argued that individuals joining an organization move along an inclusionary dimension, which is related to the degree of latitude they get in shaping their role in the organization. Newcomers assume custodial roles that entail low latitude in shaping their roles and acceptance of the status quo (Van Maanen & Schein, 1979). In contrast, individuals with longer

tenure in the organization are given more latitude in shaping their organizational roles, thus having the opportunity to become role innovators. Role innovators seek actively to alter a role's knowledge base, strategic practices, or traditionally established goals. They use their role latitude to negotiate job-related issues (Dansereau, Graen, & Haga, 1975). Graen (1976) later suggested that the role adjustments that individuals make are rare and happen only in the early weeks on the job. Moreover, the role making theory implies that the process of role adjustment generally ends at some point, as it evolves in role routinization.

More recent work has also acknowledged that individuals may play a role in shaping what they do at work. Various research perspectives such as task revision (Staw & Boettger, 1990); role innovation (Nicholson, 1984); role making (Graen & Scandura, 1987); personal initiative (Frese, Kring, Soose, & Zempel, 1996; Frese, Fay, Hilburger, Leng, & Tag, 1997); and organizational citizenship behavior (Organ, 1988) have posited that individuals may sometimes initiate activities that are not part of the formally required behaviors on the job. All these previous concepts have a different focus and do not capture the multi-faceted aspect of job crafting.

To summarize the main differences between previous concepts and job crafting, these concepts are mostly focused on the task boundaries of the job (i.e., task revision) or do not explicitly consider relational or cognitive boundaries; they refer to mostly reactive, problem-solving activities (i.e., personal initiative, organizational citizenship behavior, task revision), without considering the possibility that employees may engage in these behaviors even when tasks or activities are not dysfunctional; they reflect more formal processes, where emergent task elements are added to a job or a role until they become part of the formal job description or role (role making, role innovation); they generally have less depth in terms of individual implications (i.e., do not change one's job identity, as job crafting can do); and are focused generally on helping others (i.e., organizational citizenship behavior) or supporting the collective or organization in which the individual is a member (i.e., personal initiative, task revision).

In contrast to the related concepts described above, job crafting is a creative and improvised process not necessarily oriented toward improving task performance, helping others, or supporting

organizational goals. In general, individuals craft their jobs to achieve a better fit between the job and their own motivation, interests, skills, and understandings of work. Further, compared to other related conceptualizations that view similar phenomena as processes that occur only when employees have a significant degree of job autonomy, the job crafting perspective recognizes the individual as an active "crafter" of her work across settings varying in the autonomy granted to the individual (Wrzesniewski & Dutton, 2001).

In this dissertation, I explore the three boundaries of jobs that individuals can shape in their work – tasks, relationships, and meanings of work. Since previous work in this area is mostly theoretical, and empirical evidence is relatively scarce and mostly qualitative (Wrzesniewski & Dutton, 2001; Fine, 1996; Fletcher, 1998, 1999; Strauss, Fagerbaugh, Suczek, & Wiener, 1985), there is a lack of adequate quantitative measures that capture the content of job crafting, or how people shape the boundaries of their work. In particular, understanding how people craft their jobs would require understanding whether people alter the content and the number of tasks, how they shape their interpersonal relationships with particular employee groups with which people choose to interact at work, and how people's definition of their work is actively shaped, in terms of work meaning and significance.

Research question 2: What is the effect of the context of work on job crafting? In line with recent calls from several organizational scholars for a more comprehensive examination of context in research (Rousseau & Fried, 2001; Johns, 2001), my dissertation explores the contextual influences that shape individual job crafting behaviors. The idea that the context of work affects individuals' attitudes and behaviors at work is not new. As suggested previously, organizational research has explored the role of job characteristics or the influence of others' perceptions of work on people's attitudes and behaviors (Hackman & Oldham, 1975; Pfeffer & Salancik, 1978). For example, laboratory research has indicated that experimentally-manipulated opinions of others influenced task satisfaction to a greater extent than the objective characteristics of the job itself (O'Reilly & Caldwell, 1979; White & Mitchell, 1979; Weiss & Shaw, 1979).

Further, the communities of practice literature illustrates how the social context of work is important in shaping workers' understandings of work, approaches to work, and interactions at work (Orr, 1990; Lave & Wenger, 1991; Brown & Duguid, 1991; Bechky, 1999; 2003 b). These studies suggest that learning at work is a social process that occurs in communities of practice, where people acquire a particular community's subjective perspective and learn to speak its language. Through story telling, individuals learn not only from their own experience in work, but also from the experience of others (Orr, 1990; 1996), and this learning process may influence their crafting behaviors.

However, as Wrzesniewski, Dutton, and Debebe (2003: 95) noted, "our field suffers from a shallow understanding of the role of others at work". What others do to craft their own work may interact with an individual's attempts to craft her work (Wrzesniewski & Dutton, 2001) due to social interaction. How does the structural and relational context of work affect individuals' understandings of work, approaches of work, and behaviors at work? In this dissertation, I explore the effects of the structural and relational contexts of work on the choices individuals make to craft their jobs. I chose to explore the relational and structural contexts of work because they presumably exert a strong influence on how people do their work across a wide range of organizational contexts.

More specifically, I explore how important structural aspects of the context of work – such as a sense of discretion over work processes, task interdependence with others at work, and task complexity – affect individual job crafting behaviors. I further explore how the workgroup context and the occupational communities of practice in an organization shape the processes through which individuals actively alter the boundaries of work. Since the proximal context of work has a more potent impact on individual behaviors than the more distal context (Moreland & Levine, 2001; Spreitzer et al., 2005), social influence tends to be local and confined to the groups with which individuals interact on a daily basis. Further, local subcultures and small communities of practice often develop within organizations, where knowledge is localized and embedded in the practice of the community (Lave & Wenger, 1991).

Research question 3: What are the outcomes of job crafting? The existent literature on job crafting looks mainly at the job crafting outcomes in terms of altering meanings of work and work

identities (Wrzesniewski & Dutton, 2001; see also Fine, 1996; Pratt & Ashforth, 2003). Some other related conceptualizations have looked at different purposes or outcomes, such as improving a faulty role or procedure (role innovation - Schein, 1971; task revision - Staw & Boettger, 1990), or helping others in the organization (organizational citizenship behavior - Organ, 1988), thus suggesting potential improvement in the performance of the job crafter as well as the performance of others. In this dissertation, I explore the outcomes of job crafting through a broader lens, by exploring affective outcomes such as job satisfaction and organizational commitment, as well as effectiveness implications of job crafting, since the task alterations that individuals attempt on the job and the knowledge transfer processes generated through shaping relationships at work may lead to the selection of superior task routines, and therefore individual and collective learning (Argote, 1999).

I also explore potential consequences at the group level, recognizing that job crafting may have contrasting effects at different levels of analysis. For example, it may be that an individual's attempts to craft her job may positively affect her own outcomes in terms of job satisfaction or performance, but may not necessarily positively affect the outcomes of the team in which the individual is embedded, because team members may have different conceptions of how work should be carried out. This idea highlights the relational nature of work in organizations (Leana & Rousseau, 2000; Gersick, Bartunek, & Dutton, 2000), and how relationships at work connect the individual with the larger organizational context, shape the knowledge boundaries of work, and impact performance at multiple levels of analysis.

1.3 LEVELS OF ANALYSIS

The processes through which individuals shape the task and relational boundaries of their work cross two different levels of analysis: the individual and the workgroup. Individuals may alter the content and nature of the tasks in which they engage at work in ways that affect not only their work, but others' too. Since most work in organizations has some level of interdependence among different people, others may react and adapt to an individual's attempts to change the nature, content, or number of tasks. In the process of

work coordination, people may actually shape each others' tasks in tacit or explicit ways (Wittenbaum & Stasser, 1996). Others may see an individual's attempts to craft her work in positive ways and thus engage in similar behaviors (Moscovici, 1985; Worline, Wrzesniewski, & Rafaeli, 2002), or may view them as deviance and therefore have a negative reaction to these behaviors, for example by expressing overt hostility or rejecting the deviate from the group (Levine, 1989). Thus, shaping tasks in organizations is a meso-level process (House, Rousseau, & Thomas-Hunt, 1995).

Shaping relationships through which work gets done is also a meso-level process that crosses the boundaries between individuals. With the increased use of teams in organizations (Cohen & Bailey, 1997) and the development of communities of practice in many workplaces (Brown & Duguid, 1991), the meso-level processes involved in team or community of practice interactions provide a context where job crafting occurs and affects the attitudes, behaviors, and performance of all actors involved. Shaping the cognitive meaning of one's work may be an individual level process, but it is likely to be shaped by the social context, and thus by others at work (Salancik & Pfeffer, 1978), through processes of social influence. Further, individuals may craft their work together with their co-workers, by tacitly or explicitly negotiating roles in their work groups.

In sum, exploring job crafting in organizations requires a meso-level approach that focuses on the place where job crafting occurs in organizations. Therefore, this dissertation adopts a meso-level perspective on job crafting, by recognizing that job crafting behaviors occur through the experiences that individuals develop in their work, but in the social context in which they are embedded at work.

1.4 RESEARCH SETTINGS

My research was conducted in two settings that provide interesting opportunities to explore employee job crafting. The data collection process in both settings is complete. I used multiple methods of data collection in each setting. The research design involved a first study that preliminarily explored job crafting, and a more extensive study that examined job crafting in more detail. Both studies utilized

surveys for collecting data on individuals' behaviors and relationships with others in the organization, and relied on both quantitative methods (i.e., survey data collection, archival data) and, in a more limited extent, qualitative methods (i.e., interviews, observations, and a focus group), to develop a better understanding of how individuals crafted their jobs, the relational and structural antecedents of crafting, and the implications at different levels of analysis.

The settings selected cover two different contexts that provide complementary perspectives on job crafting – a manufacturing organization in the auto industry utilizing craft-like work and autonomous teams of assembly workers; and several service organizations (schools) utilizing professional work of special education teachers. Work experiences in the two settings share similarities but also differ in important aspects. Both similarities and differences will enable me to draw generalizable inferences about job crafting in organizations. Similarities are valuable because they enable to draw parallels between the crafting that takes place in the two occupations and types of work. Differences are valuable because they enable generalizing inferences about the present occupations to other types of work.

In terms of similarities, both craft work in autonomous teams and professional work in school settings provide individuals significant discretion in work, and thus enhanced opportunities to observe crafting (Wrzesniewski & Dutton, 2001). Further, in both cases, employees draw upon a broad range of skills to do their work – manufacturing workers in the setting selected had broad sets of skills utilized to perform various tasks in their teams (e.g., being able to perform all tasks for assembling half of the vehicle); special education teachers draw upon regular and special education knowledge to do their work. These elements make the individual and her job crafting behaviors a more salient and critical element for performance.

Regarding differences, the two occupations differ in terms of education requirements, status, degree of proximity and contact with the beneficiaries of work, and impact on the beneficiaries of work. Teachers are required to attend college and even graduate studies (e.g., Masters in special education); manufacturing workers perform their work with substantially less education. Teaching work is considered higher status than assembly work in manufacturing. Further, teachers – as many service workers – work

in high proximity with their beneficiaries (e.g., students) and have frequent contact with them, compared to manufacturing workers. Finally, teachers' work has a more direct, visible impact on the beneficiaries of work than assemblers' work.

In addition, the two settings help answer complementary questions regarding the antecedents of job crafting. Work in team-based manufacturing affords a better understanding of team-level influences on job crafting. The work of teachers affords a better understanding of occupational group influences, as well as organizational level influences on job crafting, since several organizations were included in the study.

Research setting 1: Craft work in a manufacturing organization. The first setting allows a preliminary exploration of job crafting in autonomous teams in a manufacturing organization - the Volvo Uddevalla car factory in Sweden. Workers in the plant assembled cars in small independent teams, and the high level of autonomy granted to workers and teams in this setting provides an interesting lens to explore job crafting. In addition, in this research context I explore important team-level influences on individuals' decisions to craft their jobs. I collected survey data from 164 auto assembly workers involved in team-based production and complemented this with supervisor ratings and archival data.

Work in this setting has been described as the craft work of our era, or "neocraft", by different observers (Berggren, 1994). This study of craft workers provides an interesting lens to study how performance differences among different individuals and among different teams can be traced back to different ways in which workers enact their jobs and shape their patterns of interaction with others. The context of team autonomy provides a perspective on exploring social embeddedness at work and how it affects the way individuals shape the boundaries of their work.

Autonomous team-based manufacturing is an appropriate setting to explore job crafting behaviors from the perspective of the knowledge boundaries of work. First, team-based manufacturing today is often knowledge-driven work (Cutcher-Gershenfeld et al., 1998), where relevant knowledge is located at all levels in the organization, and individual and team work require the effective use of this knowledge

across boundaries. Important task knowledge is embedded in the social interactions among team members and with other teams, thus job crafting behaviors alter the knowledge boundaries of individuals and teams. Second, research on transactive memory in groups has indicated that workgroups develop idiosyncratic memory systems of who knows what in the group, which improve group performance , by helping members in planning their work more sensibly, improving coordination, and solving problems more quickly and easily (Liang, Moreland, & Argote, 1995; Moreland, 1999). Third, previous research on high-involvement work practices has shown that knowledge sharing through social ties is an important factor in achieving performance, because it allows workers to expand their skills and knowledge required for problem solving (MacDuffie, 1995; Pfeffer, 1998; Batt, 1999; Osterman, 2000). Social ties that cut across different individuals and groups are essential to performance because knowledge in practice is usually localized, embedded, and invested in certain work practices (Szulanski, 1996; Hansen, 1999; Carlile, 2002). Manufacturing performance is contingent upon skilled workers developing and distributing knowledge on the factory floor and communicating across occupational boundaries with technicians and engineers (Bechky, 1999, 2003b).

In this setting, work has been traditionally organized around highly autonomous teams completing tasks that were complex and had long cycle times. For accomplishing their work, workers were trained to learn the full range of skills needed in building the product and rotated within their teams to maintain familiarity with all the tasks and ensure high levels of work variety. Thus, the teams developed a high depth of skill level, flexible roles in the team, and localized approaches to accomplishing their tasks. Idiosyncratic work patterns within the teams and different levels of team external communication with diverse external actors led to further localization of their practice and high heterogeneity in output quality.

I visited the plant three times to get a better understanding of work processes and observe teams doing their work. The data I collected in this setting include surveys of all assembly workers involved in teamwork on the shop floor, interviews with workers, supervisors, and managers, observations and videotaping of the teams, and archival data on performance and individual absenteeism.

Research setting 2: Professional work in school settings. My second research setting affords a richer context to explore the content of job crafting and in particular, the organizational and collective influences on job crafting. In this study, I surveyed 626 special education teachers in 200 schools from a large urban public school district. I also conducted qualitative work to understand in more depth the specific behaviors through which teachers craft their work. Based on observations and interviews with several teachers, interviews with specialists and administrators in the district, and a focus group discussion with specialists from the union organization in the district, I developed and refined a measure of job crafting.

Barley and Kunda (2001) noted that studies of occupations that have come to dominate the occupational structure and define the changing nature of work in the late twentieth century (such as sales people, managers, engineers, technicians, and service workers) are conspicuously rare. The main focus of this study is one of these overlooked occupational groups, a particular type of service workers – special education teachers. As an occupational group that exhibits high degrees of professional identification, different degrees of structural constraints or enablers of work, and tremendous variability and uncertainty in the task environment – special education teachers constitute an interesting group for exploring job crafting behaviors.

There are several reasons why the work of special education teachers provides an interesting context to study job crafting. First, teachers in general are increasingly viewed as working collectively in communities of practice (Louis, Marks, & Kruse, 1996). The traditional view was that teachers were performing individual, isolated, and routinized jobs, in a professional environment that fostered individual autonomy (Sarason, 1990; Warren, 1975). More recent perspectives view teachers as actively engaged in professional communities, in which they work collectively to generate, combine, and transmit knowledge, in efforts to improve their teaching practice. Participation in these professional communities increases teachers' sense of craft (Louis, Marks, & Kruse, 1996), influences the development of effective teaching techniques, and diffuses these superior practices, and thus has important consequences for student

learning. Thus, the communities of practice in which teachers work are an interesting setting in which job crafting behaviors can be explored.

Second, the literature documents high levels of job stress and subsequent problems for schools in increasing the retention of special education teachers (Cooley, 1995). Among the many factors contributing to job burnout and turnover among special education teachers are resource shortages, lack of visible student progress which might lead to an imbalance between effort and rewards, excessive caseloads and paperwork, challenging student characteristics, and a sense of isolation that special education teachers experience in their work, due to a lack of collegial and administrative support and understanding of the difficulties of their work, and the physical isolation in which some special education teachers perform their work. Job crafting may be an avenue through which these teachers cope with their stressful work environment and achieve a better fit between their work and their own skills, interests, motivations, and conceptions about how teaching practice should be carried out.

Third, teachers' work in general and special education teachers' work in particular exhibits high levels of task complexity (Rowan, Raudenbush, & Cheong, 1993). Special education teachers' work is complex because the task environment contains high levels of variability (special education teachers must be able to master both general content knowledge and knowledge related to how to adapt content for special student needs). Further, teachers face high levels of input uncertainty (Argote, 1982) and task unstructuredness, because of the variability in student needs. Facing higher levels of task complexity, special education teachers' work may provide increased opportunities for job crafting.

The data I collected in this setting include surveys of special education teachers that provide information on individuals' attitudes and behaviors, surveys of teacher supervisors (e.g., coaches in each school) that provide organizational level data, and interviews with special education teachers and administrators.

The next chapter (Chapter 2) reviews the literature relevant to the research questions explored. In Chapter 3, the research model is proposed and described, as well as the propositions guiding this research. The model and propositions describe the structural and relational factors in the context of work that shape

opportunities and motivations to craft a job, as well as the outcomes associated with job crafting. Chapter 4 outlines the rationale for the empirical contexts selected, as well as the methodology, data collection procedures, and the measures used in Study one. Chapter 5 presents the analysis of the hypotheses tests for Study one. Chapter 6 outlines the methodology, data collection procedures, and the measures used in Study two. Chapter 7 presents the analysis of the hypotheses tests for Study two. Finally, a discussion and integration of the results of the two studies, as well as overall conclusions are presented in Chapter 8.

2.0 LITERATURE REVIEW

> *"His universe of instruments is closed and the rules of his game are always to make do with 'whatever is at hand', that is to say with a set of tools and materials which is always finite and is also heterogeneous because what it contains bears no relation to the current project, or indeed to any particular project, but is the contingent result of all the occasions there have been to renew or enrich the stock…Consider him at work and excited by his project. His first practical step is retrospective. He has to turn back to an already existent set made up of tools and materials, to consider or reconsider what it contains and, finally and above all, to engage in a sort of dialogue with it and, before choosing between them, to index the possible answers which the whole set can offer to his problem." (Levi-Strauss, 1966: p. 17-19)*

As suggested by the above passage, and drawing upon Levi-Strauss's "bricolage" metaphor to capture modes of thought, work in organizations gets done in ways that are often different from any formal job descriptions, manuals, or training programs. Actual practice is often a result of a "reflective manipulation of a set of resources accumulated through experience, with the range of manipulation neither totally free nor constrained to the original manifestation of any element" (Orr, 1990: p. 184). Many employees' actual work practice differs significantly from formal job descriptions because workplaces are arenas that structure action (Darrah, 1992; 1994). In many work situations, individuals consider formal job descriptions as only a guide to how their work should be done, and enact their jobs in idiosyncratic ways, depending on individual interpretation, interest, skills, and initiative.

It has been suggested in the previous literature that most studies of work have focused on work as the employment relationship, while ignoring the actual work practice, or what people actually do in the doing of their jobs (Orr, 1996). The implicit assumption was that work in most organizational settings is done according to written manuals or training programs, and that there is a specific, prescribed way in which work is to be done. Therefore, many researchers have generally overlooked the question of how work is actually carried out in organizations, taking the individuals and the work groups out of the

equation in terms of their potentially active role in the enactment of their work. Work has been seen as an abstraction or an input into a production function, thus taking an invisible nature (Barley, 1990), resembling a "black box" (Darrah, 1992) where the practice of work remains opaque and inaccessible.

In this dissertation I explore what constitutes the idiosyncratic individual experience of jobs in organizations, what leads to such experiences, and the implications of these processes at various levels in organizations. I build on the recent research work challenging the traditional understandings that individuals react to the demands of their jobs, jobs precede individuals, and routines cannot be changed by individuals and thus constitute sources of inertia in organizations (Wrzesniewski & Dutton, 2001; Miner, 1987; Feldman & Pentland, 2003). I also explore how individuals collectively enact their jobs in unique ways, by working together and sharing work practices among them. In doing that, I build on existent literature looking at how communities of practice (Orr 1990; Lave & Wenger 1990; Brown & Duguid 1991) and work groups (Levine & Moreland 1991; Waller 1997) engage in actual work practice that differs in significant ways from espoused practice.

This chapter reviews the relevant literatures that inform our understanding of how, why, and with what consequences individuals and work groups shape the experience of their jobs in unique ways. The chapter begins with a review of the seemingly disconnected and fragmented literature on job crafting and other conceptualizations of similar phenomena in organizations. I complement this with a review of the relevant literature on communities of practice and small groups, which inform our understanding of the collective aspects of job crafting in organizations. I then review work that addresses the main facets or boundaries of work that can potentially be shaped by individuals trying to "enact" their jobs – the literatures on job design, work routines, the meaning of work, and social relationships at work. I conclude the chapter with a discussion of the role of the social context in which work happens on the crafting behaviors that take place in organizations.

2.1 INDIVIDUALS' EXPERIENCE OF WORK IN ORGANIZATIONS

Individuals' experience of work in organizations has been a central interest for researchers in diverse traditions, such as job design (Hackman & Oldham, 1976; 1980), social information processing (Salancik & Pfeffer, 1987), and organizational socialization (Van Maanen & Schein, 1979). A common pattern that emerges from the job design and social information processing literatures is that researchers view individuals primarily as passive receivers of influence from other external factors, such as characteristics of the job itself or the social context of work, or that the experience of work is predetermined by individual dispositional traits or personality characteristics (Hackman & Oldham, 1976; Salancik & Pfeffer, 1978; Staw & Ross, 1985; Staw & Cohen-Charash, 2005).

For example, researchers in the job design tradition (Hackman & Oldham, 1976, 1980) have theorized that individuals respond to their jobs in ways that reflect the motivating potential of jobs, in terms of objective task characteristics, such as the skill variety applied to the job, the extent to which the job involves doing an identifiable piece of work, the significance of the job on others, the level of work autonomy, and the feedback form the job itself. In this case, managers are the "crafters" who shape the jobs that individuals perform in organizations. However, these researchers offered a more nuanced view, arguing that individual differences in growth need account for different individual reactions to job design. In the social information processing approach (Salancik & Pfeffer, 1987), individuals are viewed as receptors of social cues from their coworkers, who interpret these cues and incorporate them into their responses to the job. In contrast, the organizational socialization literature – although it initially portrayed individuals as malleable receivers of influence from all around them in the organizational context, such as mentors, supervisors or coworkers – it later on changed its tune to look at role changes that individuals may initiate as a result of the organizational socialization process (Van Maanen & Schein, 1979).

More recently, researchers have begun to examine the extent to which individuals proactively shape the experience of their jobs in idiosyncratic ways that fit their motivations, interests and skills (Wrzesniewski & Dutton, 2001; Rousseau, 2005). What constitutes the experience of work from a

performance standpoint does not mean only the straightforward completion of work as prescribed by the task, but rather the processes through which individuals actually approach and shape their jobs to get their work done. As the work context becomes more dynamic, decentralized, and new forms of management are introduced that minimize surveillance, organizations increasingly need to rely on employees' personal initiative and proactive behaviors to identify and solve problems, which may include departing from the prescribed job tasks and altering work routines.

There are two main issues that I use next to ground this discussion -- the proactive engagement of individuals in their jobs, and work as emergent from individuals' actions that may differ from the task script. First, the proactive aspects of behaviors and initiative at work refer to an action orientation toward the behaviors of individuals in organizations. Individuals take an active role in their approach of work, they initiate situations and create favorable conditions, and actively seek information and opportunities for improving things (Crant, 2000). When individuals proactively engage in shaping their jobs, they may do so as part of their in-role behavior in which they fulfill basic job requirements. For example, copy machine technicians use the prescriptive documentation only as a guide in their work, but they often need to improvise task strategies to deal with the sophisticated and unpredictable machines they work with, to do their repair work (Orr, 1996). Sometimes they talk about following the diagnostic procedures in the documentation in cautious terms, because some of the scripts are actually flawed. Along similar lines, workers may proactively seek feedback on their routines and procedures with the goal of improving task performance. Individuals may also engage in proactive behaviors that are extra-role, such as trying to redefine their role in the organization by identifying and using opportunities to shape the scope of their jobs in broader terms. For example, copy machine technicians' work deals not only with machine repairs, but also with keeping the customers happy, so that technicians often engage in activities to maintain and repair social relationships with customers (Orr, 1990). Technicians with no service calls to do perform "courtesy calls' to check on the machines and talk to customers to see if any problems are developing . They also keep the customers assured that the situation is under control, by explaining the particular machine's problems and repairs, especially for difficult problems that occur intermittently. Therefore,

some of the technicians use the slogan "Don't fix the machine; fix the customer!" to guide their daily work (Orr, 1990: p. 172).

Second, the discussion of how individuals actively shape their jobs essentially involves a consideration of organizational routines and work as emergent from individuals' actions that may differ from the task script. Routines are generally defined as temporal structures that are often used as a way to accomplish organizational work (Feldman, 2000). The traditional view on organizational routines conceptualizes them as sources of inertia (Nelson & Winter, 1982; Cyert & March, 1963), with the potential of creating dysfunctional behaviors because individuals and groups tend to get stuck in performing the same "habitual routines" (Gersick & Hackman, 1990). Organizational literature (see March, Schultz, & Zhou, 2000) suggests that routines are created and change slowly through processes of evolutionary emergence (Nelson & Winter, 1982; Opp, 1982), problem solving when organizational performance targets are not met, political processes of negotiation with power holders (Cyert & March, 1963), experiential learning as a consequence of inferences drawn from the experience with existent routines (Levitt & March, 1988), and diffusion from one organization to another or among parts of an organization (Cohen & Levinthal, 1989). However, these perspectives deal with organization and population level processes, while not addressing how individuals working in organizations actively shape the routines that constitute their jobs. At this micro level of analysis, new insights can be gained from recent work challenging the traditional understanding of routines as sources of inertia in organizations, which has suggested that routines have a dual aspect, thus allowing individuals to change them (Feldman, 2000; Feldman & Pentland, 2003). One aspect of organizational routines is the ostensive facet, which embodies the structural component of a routine, which guides work. The second aspect of organizational routines is the performative facet, which embodies the specific actions, by specific people, at specific times and places (Feldman & Pentland, 2003). Both aspects of routines change over time: while the performative aspect evidently changes as it constantly reflects ways in which individuals actually do their work on a day-to-day basis, the ostensive aspect also has the potential to change, as individual

performances of routines accumulate superior results, and generate superior practices that come to modify the ostensive aspect.

The proactive view of individuals as engaging in the enactment of their jobs and the view of organizational routines as embodying actual performance in organizations reflect a view of work in organizations where individuals take on agency roles as opposed to reacting to existent structures. According to this view, individuals' experiences of work in organizations is less about fitting into predefined roles and following prescribed routines, and more about enactment of idiosyncratic roles and emergent routines that reflect actual work practice, depending on individual interests and skills, and the collective understandings of work.

2.2 PERSPECTIVES ON JOB CRAFTING

2.2.1 Idiosyncratic Jobs

Some initial insights into the role of individuals in shaping their jobs come from organizational studies exploring "idiosyncratic jobs" (Miner, 1985; 1987; 1990). More specifically, Miner challenges the traditional view (what she calls "the vacancy assumption") that jobs precede individuals, both logically (jobs are designed with a particular organizational goal in mind and independent of any particular individual, and individuals will take the jobs and adapt to their demands) and temporally (the mix of activities in a job is established in advance, then the individual takes the job). Miner (1985, 1987) proposes instead that in many organizations, including bureaucratic ones, jobs are actually created around individuals rather than pre-planned in advance. These "idiosyncratic jobs" are defined by two key characteristics: the creation of the job in its current form was prompted by the existence of the job holder, and the mix of job tasks was designed to match the perceived abilities, interests, and priorities of the individual around whom the job was created (Miner, 1985).

Miner's (1985; 1987) work has indicated empirical support for the idea that idiosyncratic jobs are more likely to be created in organizations when there is a high level of mission ambiguity and resource uncertainty, suggesting that task uncertainty may play a role in giving individuals latitude in shaping their jobs. However, the role of task uncertainty has not been studied in this research.

This literature leaves two main questions unanswered. First, it is not clear to what extent individuals are actually shaping the day-to-day activities in these idiosyncratic jobs. While jobs are created with the particular individual's skills and interests in mind, it may be that the individuals have no further role in initiating changes to their jobs, once they were created. Second, it is not clear from the idiosyncratic jobs research how individuals shape the specific tasks and relationships needed to carry out their work. While the idiosyncratic jobs literature acknowledges that under specific conditions, organizations create jobs to fit individuals' skills and interests, we still need to learn more about the actual processes through which individuals shape the boundaries of their jobs.

Therefore, the literature on idiosyncratic jobs, although acknowledges that sometimes jobs are created to match specific individuals and their abilities, interests, and priorities, does not specify whether individuals actually play a role in shaping their jobs after they take specific positions that were created for them.

2.2.2 Role Innovation

Work in occupational socialization has suggested that individuals can have different degrees of involvement in shaping their roles. For example, Schein (1971) argued that professionals are likely to assume three types of roles in their careers. Individuals assuming "custodian" or traditionally defined roles totally accept (and implicitly agree with) the current norms of the profession related to practice and the knowledge underlying the profession, and work at maintaining these norms. In contrast, those who engage in "content innovation", while accepting the norms related to professional practice, are dissatisfied with the existent knowledge base that underlies the profession and try to redefine it. Finally, "role innovators" reject the basic norms that govern the practice of the profession and are concerned with the

fundamental role of the professional in society (Schein, 1971), trying to redefine professional boundaries. Generally, organizational socialization literature has portrayed individuals as passive and malleable receivers of influence from those around them, such as co-workers, supervisors, or mentors. Van Maanen & Schein (1979) described organizational socialization as the "process by which one is taught and learns 'the ropes' of a particular organizational role" (p. 211). However, they further argue that individuals in organizations move along an inclusionary dimension from the "periphery" (e.g., newcomers) to the "center of things" (e.g., confidant, central figure). Therefore, newcomers to most functional areas or hierarchical levels remain on the periphery of organizational affairs for some time after entry, because they may be considered untrustworthy, or they must be tested informally or formally in terms of abilities, motives, and values, before being granted inclusionary rights. At this stage, individuals assume a custodial role, which entails not questioning but accepting the status quo. If things go well, individuals are granted more say in the group's activities and are given more opportunity to exert influence. Individuals who after assuming a given organizational role, seek actively to alter its knowledge base, strategic practices, or traditionally established goals display an innovative behavior. In sum, this literature suggests that individuals assume different roles (e.g., role custodians, role innovators) in organizations, which give them various levels of influence in what they do at work, through the process of organizational socialization.

The idea that individuals can craft new roles within the constraints of existing jobs has been around for some time in organizational literature, although developed only theoretically (Katz & Kahn, 1966; Dansereau, Graen, & Haga, 1975; Graen, 1976). Katz and Kahn (1966) advanced the idea that individuals can engage in role innovation by exercising latitude with respect to the activities, methods, and style in one's role. Thus, as part of a role taking process, role innovation constitutes a person's elaboration of her role, to better adjust the role to the individual, but limited within the boundaries of the role. Further extending Katz and Kahn's arguments, Graen (1976) proposed that individuals assume organizational roles in a three-stage process, going through role taking, role making, and role routinization phases, in an attempt to influence role senders as they try to build a role for themselves that

is mutually satisfactory to role senders and to themselves. As part of the role making phase, individuals are granted a certain degree of latitude early on from their superior, and use their role latitude to negotiate job-related issues (Dansereau, Graen, & Haga, 1975). However, Graen later suggested that the role adjustments that individuals make are rare and happen only in the early weeks on the job. Moreover, the theory further implies that the process of role adjustment generally ends at some point, as it evolves in role routinization. Later on, this stream of research led to the leader-member exchange perspective (LMX; Graen, Novak, & Sommerkamp, 1982), which argued that leaders develop close relationships with a few key subordinates – the "in-group", who further get increased role latitude. In sum, it is not clear from this literature how and why individuals continue to shape their roles even long time after they take a new role in an organization.

Extending the role innovation arguments, Nicholson (1984) proposed a theory of work role transitions, which argues that individuals adjust to their work roles through either personal development (in which individuals change themselves by altering their frame of reference, values, or identity to fit the role demands), or role development (in which individuals proactively try to change the role requirements so that they better match their needs, abilities, and skills). Nicholson went further and suggested that role development may include individual-initiated "changes in task objectives, methods, materials, scheduling, and in the interpersonal relationships integral to role performance" (1984: p. 175), and noted that the changes can be positive, but also destructive. Along similar lines, Bell and Staw (1989) also suggested that individuals can act as "sculptors" of their own organizational roles rather than just passively adapting to these roles. Thus, individuals who role innovate "personalize or individualize the way a role is enacted to suit one's judgment and idiosyncrasies" (Ashforth, 2001: p. 195), and this process is not necessarily limited to the initial phase when individuals take a new role.

Existent work on role transitions has generally been very broad in terms of the nature of role changes under exploration, focusing on a variety of role transitions, ranging from inter-role transitions when an individual moves from one role to another (either sequentially held roles or simultaneously held roles), to intra-role transitions when an individual changes his or her orientation toward a role already

held (Louis, 1980; Ashforth, 2001). The focus in this dissertation is on an aspect of intra-role transitions, more specifically on job enactment processes initiated by individuals in organizations and carried through over time in day-to-day job activities. Therefore, in this dissertation I adopt the view of jobs as emergent, fluid, and negotiable shared understandings, thus drawing upon the symbolic interactionism tradition (Blumer, 1969), which views individuals as attempting to coordinate their behaviors and jointly define roles, based on subjective perceptions and preferences.

2.2.3 Other Conceptualizations Related to Job Crafting

Previous research on how individuals shape their jobs is rather scarce and scattered across several research streams in organizational theory. Some of the main conceptualizations of individual behaviors related to the concept of job crafting are presented in Table 1. One research stream looks at those discretionary behaviors that individuals put forth to support and help others in the organization or the broader organizational goals. Researchers have adopted a number of different conceptual approaches to convey the idea that these proactive, self-initiated behaviors -- that go beyond what is expected in the role and rewarded as performance – are critical determinants of organizational success. These behaviors have been conceptualized in various ways, ranging from such concepts as organizational citizenship behavior (Bateman & Organ, 1983; Organ, 1988), and prosocial organizational behavior (Brief & Motowidlo, 1986), to contextual performance (Borman & Motowidlo, 1993), and organizational spontaneity (George & Brief, 1992).

A characteristic of these behaviors is that they are not oriented toward the focal individual's job, but mostly at doing something to help others in their work, or to support the work group, or the organization as a whole. For example, organizational citizenship behavior includes generating new ideas for doing work, volunteering to help others with their work, being cheerful and supportive, cooperating with others at work, accepting orders without resentment and not complaining about work issues (Bateman & Organ, 1983). Thus, it is implied that these behaviors have almost always positive consequences for others in the work group, for the work group, or for the organization as a whole. One

exception to this is prosocial organizational behavior, which may include dysfunctional behaviors, with potential negative consequences for organizational performance.

For example, behaviors that could be dysfunctional include helping co-workers to achieve personal goals inconsistent with organizational objectives, being lenient in personnel decisions, or delivering services or products to customers or clients in an organizationally inconsistent manner (Brief & Motowidlo, 1986), or doing somebody else's work. The important aspect of prosocial or ganizational behaviors is that they are actions that are perceived by the individuals who perform them as benefiting or helping others, even if the recipient of the behavior is one of the organization's competitors (George & Brief, 1992), or the behavior is beneficial for the recipient person but detrimental for the work group or the organization.

A related stream of research has focused on behaviors that individuals initiate to take an active role in their approach toward work, actively seeking information and opportunities for improving things. These include taking charge (Morrison & Phelps, 1999), personal initiative (Frese et. al., 1997), and proactive behavior (Crant, 2000). These behaviors have in essence a problem solving orientation (Frese et. al., 1997), thus the focus is on trying to solve performance problems and improve the way work is carried out in the organization. Consequently, taking charge, personal initiative, and proactive behaviors are mostly focused on behaviors that try to improve certain organizational processes or practices that individuals perceive to be dysfunctional for the organization.

Table 1 Different Conceptualizations Related to Job Crafting

Construct	***Definition***	***Job facet***		
		Tasks	***Relationships***	***Meanings / cognitions***
Organizational citizenship behavior (Bateman & Organ, 1983; Organ, 1988)	Extra-role discretionary behavior intended to help others in the organization or to demonstrate conscientiousness in support of the organization	×	× (implicit)	
Prosocial organizational behavior (Brief & Motowidlo, 1986)	Behavior performed with the intention of promoting the welfare of individuals or groups to whom that behavior is directed	×	× (implicit)	
Contextual performance (Borman & Motowidlo, 1993)	Behaviors that contribute to organizational effectiveness in ways that shape the organizational, social, and psychological context that serves as the catalyst for task activities and processes	×	× (implicit)	
Organizational spontaneity (George & Brief, 1992)	Extra-role behaviors that are performed voluntarily and that contribute to organizational effectiveness	×		
Taking charge (Morrison & Phelps, 1999)	Voluntary and constructive efforts to effect organizationally functional change with respect to how work is executed within the contexts of their jobs, work units, or organizations	×		
Personal initiative (Frese et al., 1997)	Taking an active and self-starting approach to work and going beyond what is formally required in a given job	×		
Proactive behavior (Crant, 2000)	Taking initiative in improving current circumstances or creating new ones, by challenging the status quo	×		
Task revision (Staw & Boettger, 1990)	Taking action to correct a faulty procedure, inaccurate job description, or dysfunctional role expectation	×		
Background work (Invisible work) (Star & Strauss, 1999)	Work that is deeply embedded, part of the background, taken for granted, and invisible by virtue of routine (and social status)	×	×	
Relational practice (Fletcher, 1995; 1998)	Activities construed as "feminine" that serve to establish and maintain connection between workers	×	×	×
Articulation work (Strauss et. al.,1985)	Work that gets things back "on track" in the face of the unexpected, and modifies action to accommodate unanticipated contingencies	×	×	
Courageous behavior (Worline, Wrzesniewski, & Rafaeli, 2002)	Breaking work norms, routines, roles, and scripts in a risky situation, when there is free choice, the risk is assessed, and the action serves a worthy aim	×	×	×
Job crafting (Wrzesniewski & Dutton, 2001)	The physical and cognitive changes individuals make in the task or relational boundaries of their work	×	×	×

Staw and Boettger (1990) suggested that individuals sometimes engage in task revision processes at work, when the tasks they perform or their organizational roles are incorrectly specified. Along similar lines, Ilgen and Hollenbeck (1992) argued that individuals often create emergent task elements, especially when their roles allow them discretion on how to perform their work. Implicitly, since it is about correcting faulty or dysfunctional tasks, task revision is always hypothesized to have positive effects on organizational performance. Staw and Boettger further suggested that task revision is a form of counter-role behavior, because it differs from task expectations (individuals actually change the tasks such that tasks differ from the way they are formally prescribed). Counter-role behaviors are neither part of a formal job description, nor the management's image of the ideal employee (as it is in the case of citizenship behaviors). The literature has also acknowledged that counter-role behaviors may occur even when the tasks are well specified, in which case researchers talk about behaviors such as deviance, dissent, or grievance situations, implicitly assuming they have negative performance implications.

Most of the prior conceptualizations of individual behaviors related to how individuals enact their jobs have been focused on one facet of the job. The task facet of a job is the focus of a majority of these conceptualizations, with only a few constructs actually tapping more than task shaping behaviors. For example, task revision, organizational spontaneity, personal initiative, taking charge, and proactive behaviors are explicitly focused on actions taken by individuals in terms of shaping tasks boundaries. In contrast, organizational citizenship behaviors, prosocial organizational behaviors, and contextual performance, although they are mainly task shaping behaviors, have an implicit relational component. This is because they include behaviors that are oriented toward helping or supporting others, thus altering in certain ways the nature or the frequency of relationships with other actors. This is the case of helping and cooperating with others (contextual performance; Borman & Motowidlo, 1997), organizational courtesy and altruism (organizational citizenship behavior; Organ, 1988), and assisting or helping customers (prosocial organizational behaviors; Brief & Motowidlo, 1986). However, these conceptualizations do not address explicitly how the behaviors in question actually shape the nature and number of relationships one establishes at work, but only suggest a potential effect on relationships.

Recent qualitative research has begun to focus explicitly on how individuals do their work differently, in terms of both tasks and relationships, and on a consistent and continuous basis. Compared to prior related concepts such as task revision, which occur only in response to dysfunctional tasks or processes and thus have a low base in organizations (Staw & Boettger, 1990), the kind of job crafting behaviors described in this qualitative research are behaviors that occur often, in many kinds of work, and range from visible, obvious actions to more subtle, even invisible actions of employees (Nardi & Engestrom, 1999; Fletcher, 1998, 1999; Wrzesniewski & Dutton, 2001). Some examples are described below.

A significant part of the crafting work may be invisible to observers, such as co-workers, supervisors, or managers. Visible work is mostly being scripted in formal routines, mapped, flowcharted, quantified, or measured. This is the work that is the focus of management's attention, the center of restructuring initiatives and technology introduction. However, a growing body of empirical qualitative evidence suggests that there is more to work than is captured in flow charts, conventional metrics, or formal job descriptions (Nardi & Engestrom, 1999). The invisible part of job crafting may take the form of work defined as routine or manual that actually requires considerable problem solving and knowledge, such as the work of telephone operators (Muller, 1999). Telephone operators engage in an extensive knowledge work as they help customers to work through ill-formed requests for directory assistance. This knowledge work is a major component of the operators' conversation with customers, and includes both task and relational components. However, it has been missed by (and thus has become invisible to) both management, because management has preconceived ideas about what telephone operators are doing, and researchers, whose research methods prohibited them from seeing what was happening as operators performed their work and interacted with customers.

The invisible part of job crafting may also take the form of informal work processes that are not part of anybody's job descriptions, but are crucial for the collective functioning of the workplace, such as informal social relationships, conversations, open-ended meetings without a specific agenda, storytelling, gossip, or humor. One notable example is "relational practice" (Fletcher, 1998, 1999), defined as

activities that serve to establish and maintain connections between co-workers in organizations, and studied in the context of design engineers. Fletcher's main point is that while organizations today claim to need and develop team players to carry out their work, they are often unable to recognize and reward behaviors that create and encourage team work, such as "preserving", "mutual empowering", "achieving", and "creating team". Preserving relational practice includes behaviors intended to preserve the life and well being of a project, such as picking up on tasks that were outside the technical definition of the job ("shouldering"); connecting individuals on the project to individuals or resources needed to get the work done ("connecting"); and calling attention to problems ("rescuing").

The mutual empowering relational practice refers to behaviors intended to enable others' achievement and contribution to work (the project), such as "empathic teaching" and "protective connecting". The mutual empowering behaviors often included teaching others new skills in an empathetic manner that focused on the learner, and connecting others with the aim of insulating them from their own lack of relational skills. The achieving relational practice refers to using relational skills to repair potential or perceived breaks in working relationships ("re-connecting"), paying attention to the emotional overlay of work situations ("reflecting"), and calling forth responsiveness in others ("relational asking"). Finally, creating team relational practice refers to working to create the background conditions for successful teamwork, such as attending to the individual and attending to the collective.

Relational practice is an example of how individuals often engage in work activities that are not part of their formal roles, are not prescribed in formal job descriptions, but that constitute an important part of getting work done in a variety of work settings. Relational practice includes behaviors that shape in new ways the tasks individuals perform (e.g., doing extra work, calling attention to problems, etc.) and the relationships they establish to carry out their work (e.g., connecting others, teaching others, etc.). Moreover, relational practice can have significant effects on work meanings, because individuals evolve from simple task executants (in Fletcher's case, engineers) to enablers of organizational work, with potential consequences for identity changes (Wrzesniewski & Dutton, 2001).

Wrzesniewski and Dutton (2001) described the work of hospital cleaners, who crafted their work very differently, even though they had the same job at the same hospital. Some cleaners included in their work only a minimum of necessary tasks and interactions with as few others as possible. These cleaners disliked cleaning in general and considered the skill level of work to be low, and viewed their jobs as a set of discrete tasks, with low significance. Other cleaners included additional tasks outside the formal job (such as timing their work to be maximally efficient relative to the workflow in their units) and engaged in an increased number of interactions with patients, visitors, and nurses. These cleaners liked their jobs and viewed their work as an integrated whole with broader significance for the hospital.

Strauss and colleagues (1985) described "articulation work" in the context of medical work, which they defined as a type of work that gets things 'back on track' in the face of the unexpected, and modifies action to accommodate unanticipated contingencies. They further pointed out that "the important thing about articulation work was that it was invisible to rationalized models of work" (Star & Strauss , 1999: p. 10). However, these practices that appeared as nonwork serve organizations in important ways. As a particular example of articulation work, Star and Strauss described "background work", or work that is invisible, but expected and taken for granted. For example, nurses – highly visible workers in health care settings – often engage in work that is not recognized specifically and thus considered legitimate, but that is embedded under the general rubric of "care" and taken for granted. For example, Bowker, Timmermans, and Star (1995) explored nursing work in a larger project that attempted to categorize nurses' work and make visible all the work that nurses do. The tasks included in nursing classifications were "nursing interventions", or any direct care treatment that a nurse performs on behalf of a patient, which include physician-initiated treatments, nurse-initiated treatments, and performance of the daily essential functions for a patient who cannot do these. However, as the researchers note, the emphasis is on direct care – the work that nurses do to increase the well-being of a patient at the bedside. Nurses also perform tasks that are left out of the classification systems: indirect care work (e.g., coordinating treatment schedules, discharge planning, and patient supervision) and administrative care work (e.g., coordinating administrative units and supervising nurses). This discussion of articulation work and

background work suggests that work in many settings is often more than the formal job description, and the invisible part may include idiosyncratic ways in which workers shape the tasks and relationships at work to get things done and coordinate with others at work.

Finally, a more extreme form of job crafting has been documented by Worline, Wrzesniewski, and Rafaeli (2002) in their work on "courageous behavior" that breaks organizational routines, norms, and scripts, in an attempt to improve organizational performance. The distinctive aspect of this type of organizational behavior is that it involves a certain level of risk or vulnerability for the actor that decides to engage in such behavior, it also involves free choice such that the actor does not necessarily have to engage in the behavior, the situation is accurately assessed and the action is directed toward worthy aims. For example, in their study of managers and employees in a high-technology firm, Worline and her colleagues document examples of courageous behavior that not only changes established norms and routines to improve performance, but also transforms other co-workers' sense of agency in their work, because it broadens people's vision of the freedom they have within their roles and triggers emotions that enhance feelings of competence. One graphic designer in the organization describes how her manager engaged in a courageous behavior:

> *"My manager had the courage to tell the corporate branding people that the visual direction they had chosen for packaging and advertising was not good. He went on to tell them that we wouldn't be following their direction and that we would ship our own designs. […] He explained why this was better for the company. This seemed courageous to me because it was very bold and in some ways it seemed 'inappropriate'" (Worline, Wrzesniewski, & Rafaeli, 2002: p. 303).*

The designer also expressed that she realized that her job and responsibilities were much larger than she was aware before the incident, and that the incident made her feel more qualified and capable of doing her work. This example of courageous behavior illustrates how this behavior is capable of inducing emotional responses in others, and thus may inspire others in their work and change their sense of agency in their roles and their relationships with others. However, the authors argue and give examples of courageous behavior that has opposite effects on others. In the case described above, courageous behavior arouses positive emotions in others (e.g., feeling proud of the manager who engaged in courageous

behavior) and these observers will be more likely to take similar actions. However, there are instances when observers will be more reluctant to take similar actions, because of the consequences of such courageous behavior. For example, an entrepreneur who made a fixed bid on a consulting job without knowing the full extent of the problem, had to spend many hours of unpaid time to perform extra work that wasn't explicitly spelled out, because he wanted to give the customer what he agreed on, although he could have found some way to get out of the situation. This act seemed courageous for one of his employees, who stated however that he became more cautious in making his own promises in his future career.

As indicated above, courageous behavior is a rather extreme form of job crafting. Compared to courageous behavior, job crafting does not necessarily trigger emotions in others who observe the behavior, and does not necessarily involve risks. Job crafting may not even be noticed by others, such as in the cases described previously of the invisible knowledge work of telephone operators that is missed by managers, or of nurses' background work of interacting with patients and visitors that is not documented in medical records.

In reading the literature summarized here, several dimensions seemed interesting to compare the most relevant perspectives related to how people enact their jobs – task revision, organizational citizenship behavior, and job crafting. Table 2 summarizes these perspectives along the dimensions found interesting, along with courageous behavior included for contrast as an extreme form of job crafting. The five essential dimensions selected are: the content of the specific construct (behaviors and / or cognitions and beliefs), the action orientation of the behavior (whether it is reactive to specific cues in the work situation or proactive, self-initiated), the breadth of the behavior (whether it is intended to affect own work boundaries or others' work too), the type of work boundaries that are potentially affected by the behavior (tasks, relationships, meanings of work), and the depth of the behavior (whether the behavior changes work identities of the focal individual and others). These dimensions were selected because they contrast job crafting with related perspectives by showing what job crafting brings new to an analysis of people's work.

Table 2 Comparison of the Main Theoretical Perspectives on How Individuals Craft their Jobs

Dimension	***Task revision*** (Staw & Boettger, 1990)	***Organizational citizenship behavior*** (Organ, 1988)	***Job crafting*** (Wrzesniewski & Dutton, 2001)	***Courageous behavior*** (Worline, Wrzesniewski, & Rafaeli, 2002)
Content	Behaviors only	Behaviors only	Behaviors and cognitions / beliefs (about work meaning and identity)	Behaviors and cognitions / beliefs (involves risks and emotions)
Action orientation	Reactive (corrects faulty work procedures / routines)	Proactive and reactive (avoiding complaining is reactive)	Proactive	Proactive
Target	Own task boundaries	Others (helping / doing good for others, work group, and/or the organization)	Own work boundaries (not necessarily considering the effects on others / the organization)	Serves broader goal (work group, organizational, social)
Type of work boundaries	Only task boundaries	Task boundaries (relational boundaries implicit)	Multiple boundaries: tasks, relationships, and meanings	Multiple boundaries: tasks, connections with others, and meanings
Depth	Does not change one's work identity	Does not change one's work identity	Can change one's work identity	Can change the focal person's and observers' sense of the organization as a whole

Job crafting includes actions initiated by the focal individual to directly change something about his or her own work. Such actions range from performing the job's tasks in different ways than others, expanding the job's boundaries to include additional tasks that the individual considers interesting or useful, narrowing the job's boundaries by performing only the tasks that the individual considers necessary, changing work goals, or altering relationships needed to accomplish work. Job crafting is mainly oriented toward one's own job and not intended at improving others' work or organizational performance (as organizational citizenship behavior, for example); however these may be byproducts of one's job crafting in certain situations. Compared to organizational citizenship, job crafting behaviors are not necessarily about doing more or doing something for others in the organization; they are instead about

doing things differently on the job. Job crafting behaviors can be productive or supportive for both the individual and others in the work group or the organization as a whole, or can be helpful for the focal individual who initiates the behaviors, but unhelpful or even bad for others or the organization. In this way, job crafting is consistent with reflexive role behaviors (Levesque, 2001), or behaviors that are targeted toward one's own role.

Job crafting behaviors are initiated by the individual even when the tasks or roles are not ill specified (as opposed to task revision). In this case, individual behaviors that alter the way work is done may be beneficial, at least by making work more meaningful for the focal individual (Wrzesniewski & Dutton, 2001). Further, individuals may find superior ways to perform the tasks, thus having an important contribution to organizational innovation by establishing superior work practices.

In contrast to other related concepts, job crafting may not only include behaviors, but also cognitions about one's work. For example, Wrzesniewski and Dutton (2001) argue that job crafting creates alterations in the meaning of work and revisions of work identity. They provide examples from their own and others' qualitative work supporting their arguments. For example, hospital cleaners experienced their work in ways that allowed them to construct work meanings in very different ways (Wrzesniewski & Dutton, 2001; Wrzesniewski, Dutton, & Debebe, 2003). Some cleaners limited as much as possible the task and relational boundaries of their jobs, by performing only the minimum of necessary tasks and interactions to carry out their jobs. These cleaners viewed their jobs as just narrow sets of discrete tasks (e.g., cleaning rooms). Conversely, other cleaners included additional tasks to their work, to help patients and visitors and make nurses' or clerks' work easier. They also interacted more frequently with patients and visitors, to make their stay in the hospital more pleasant, and with other workers, to make their work go more smoothly. These cleaners viewed their jobs as an integrated whole and more broadly, in the context of the larger unit. They also saw how their jobs contributed to the performance of others in their units, ascribing a larger significance to their work (e.g., not just cleaning rooms, but helping patients and visitors feel better and facilitating nurses' and doctors' work).

2.2.4 Collective Forms of Job Crafting

Existent literature, reviewed above, on how individuals enact their jobs in organizations does not generally address the question of how groups or collectives craft their work. All the arguments and empirical examples have been focused on the individual as the job crafter. In their theoretical piece, Wrzesniewski and Dutton (2001) argue that "job crafting is primarily an individual-level activity, in which the individual decides how and when to shape job tasks and interactions" (p. 187). However, they suggest that collective and negotiated forms of job crafting – which may be intentional or explicit, but also unintentional or implicit – are worth exploring in future research, because in team or collective settings there may be more opportunities to craft work as part of a collective improvisation on how work gets done. Laboratory experiments on transactive memory in groups shows, for example, that work groups develop implicitly a shared system of memory differentiation, task coordination, and task credibility that guides their collective work, without openly discussing who is good at what specific task (Moreland, Argote, & Krishnan, 1996, 1998).

Preliminary empirical evidence on how groups or collectives of individuals craft work comes from at least three areas of research. First, the literature on communities of practice (Lave & Wenger, 1991; Orr, 1990, 1996; Brown & Duguid, 1991) provides useful insights on how workers collectively enact work practices, based on rich ethnographic data of workers in several occupations. Further, research on groups in social psychology adds a new layer to our understanding of how groups collectively enact routines, building on experimental and field evidence (Gersick & Hackman, 1990; Levine & Moreland, 1991; Waller, 1997). Finally, research on organizational improvisation provides insights on how action emerges in groups and organizations (Hutchins, 1991; Miner et al., 2001; Vera & Crossan, 2004). Table 3 summarizes how action emerges in communities of practice, work groups and organizations, and the outcomes of these enactment processes at different levels.

Work in Communities of Practice. The literature on communities of practice has emerged in an endeavor to explore the nature of workplace learning. In the current environment, the emphasis on

corporate training programs and complex schooling systems reflects a growing interest in learning in the workplace. In this context, this stream of research argues that it is necessary to reflect more closely on the nature of learning and our conceptualization of the learning process. More specifically, Lave and Wenger (1991) propose that learning should be viewed as a situated activity in a social context, because learners participate in communities of practitioners. The mastery of knowledge and skill to do the work requires newcomers to move from "legitimate peripheral participation" toward "full participation" in the practices of the community, through an apprenticeship learning process.

Communities of practice can be situated inside an organization, outside the boundaries of any organization, or can span the boundaries of multiple organizations. However, the insights we gain from the research on communities of practices can be translated to many organizational settings, where workers learn from each other and collaborate to get their work done. This is because work practice and learning should be analyzed and understood not only in the formal work groups, but also and more importantly in the communities or networks that emerge among workers to get their work done. As Brown and Duguid (1991) suggested, looking only at the formal work groups will reflect the dominant assumptions of the organizational core, which not always reflect accurately the reality of work in organizations.

This view of apprenticeship learning in communities of practice emphasizes the importance of the social context of work in the way work gets done in organizations. Organizational members learn "knowledgeable skill" while they practice their craft and move from the periphery of the community -- where they perform only a narrow set of tasks, -- to the center of the community, by becoming a full member -- one that has gained mastery of all skills required to perform the full range of tasks (Lave, 1991). Newcomers pick up invaluable know-how while they observe the competent practitioners doing their work. The form in which the access to the full set of practices is secured for apprentices depends on the characteristics of the division of labor in the social milieu in which the community of practice is located (Lave & Wenger, 1991).

Table 3 Conceptualizations of Job Crafting by Collective Actors

Collective actor	***Forms of crafting***	***Outcomes at different levels***		
		Individual	***Collective***	***Organization***
Community of practice	"*actual practice*" (Orr 1990) "*noncanonical practice*" (Brown & Duguid 1991) "*work arounds*" (Brown & Duguid 1991)	Knowledgeable skill (Lave & Wenger 1991; Lave 1991; Brown & Duguid 1991; 2001) Construction of identity as a practitioner (Orr 1990)	Innovation (Brown & Duguid 1991) Reconstruction of collective identity (Orr 1990; Brown & Duguid 1991)	Organizational innovation (Brown & Duguid 1991) Organizational change (Brown & Duguid 2001)
Work group	*Group routines* (Levine & Moreland 1991; Zurcher et al. 1966) *Group multitasking behavior* (Waller 1997) *Deviance in groups* (Moscovici 1985; Levine 1989)	More interesting work Facilitate the individuation of workers Reduce boredom (Roy 1955; Zurcher et al. 1966; Levine 1989; Levine & Moreland 1991)	Enhance task performance, flexibility, efficiency; coordination, communication Sometimes, negative performance effects Promote cohesiveness (Zurcher et al. 1966; Levine 1989; Levine & Moreland 1991)	Both positive and negative performance effects
Work group / organization	*Bricolage* (Levi-Strauss 1966; Weick 1993) *Collective improvisation* (Hutchins 1991; Vera & Crossan 2004) *Behavioral, artifactual, interpretive productions* (Miner et al. 2001)	Individual survival (Weick 1993) Motivation (Crossan & Sorrenti 1997)	Contingent performance/ learning consequences (Miner et al. 2001; Vera & Crossan 2004)	Contingent performance outcomes (Miner et al. 2001; Vera & Crossan 2004) Organizational learning (Miner et al. 2001) Organizational memory (Moorman & Miner 1998)

According to Lave and Wenger (1991), the community of practice is an intrinsic condition for the existence of knowledge, in part because it provides the interpretive support necessary for making sense of the knowledge heritage. A view of the workplace through the lens of communities of practice helps us understand why in many situations, actual work practice is very different from espoused practice (Orr, 1990; Lave & Wenger, 1991). For example, Orr (1996) describes how copy machine technicians collectively enact practices that contrast with the way the same work is described in organizational manuals, training courses, or formal job descriptions:

> *"Other questions remaining [...] are whether there is a possible conflict between work as doing, as practice, and work as activities explicitly prescribed in the relationship of employment, and what might be revealed about such a conflict by a study of work practice. The work done by the technicians I studied is often very different from the methods specified by their management in the machine documentation. There is clearly a disparity between the tasks that they are told to accomplish and the means that are said to be adequate to the task. The technicians choose to give accomplishing the task priority over use of the prescribed means, and so they resolve problems in the field any way they can [...]." (Orr, 1996: p. 149)*

Compared to "canonical" (or "espoused") practice (Orr, 1990; Brown & Duguid, 1991), actual practice, termed "noncanonical" practice by Brown and Duguid, involves tricky interpolations between abstract accounts and situated demands, to cope with the "clash" between prescriptive documentation and the sophisticated, yet unpredictable work situation that workers encounter. The collective enactment of the practice of technicians is constructed through narration (or "story-telling"), collaboration, and social construction. Through narration, workers create complex causal stories about the history of the repairs and troubles of the copy machines, they circulate them as part of their noncanonical work practice, and use them as repositories of accumulated wisdom that the community of technicians could draw upon when needed. Thus, learning in communities of practice takes place through a process of social construction of understanding that is represented in stories and may be accomplished with stories. Story telling is socially situated, because stories emerge in certain contexts, or emerge differently in different contexts, and the people hearing the stories shape them as well further. Stories are used to make sense of ambiguous situations (Orr, 1990), where the formal documentation cannot help them to get their work

done. They become accumulated wisdom in the collective memory of the community, on which technicians can draw upon in their practice.

A characteristic of the actual practice in communities of practice is that it is in essence collaborative, such that individual learning is inseparable from collective learning (Brown & Duguid, 1991), because it is socially constructed and distributed. For example, in Orr's (1990; 1996) account of the technicians work, the technicians like to work together and discuss problems in groups, develop insights, and construct new options. As Orr notes, "there appears to be every incentive to share information and virtually none to keep it private" (1990: p. 174). This is mainly because technicians' knowledge about solving difficult problems with the machines helps them to build their reputation, when it is shared with other technicians. Finally, actual practice is also socially constructed, because individuals construct a shared understanding through a process of collective sense making out of particular difficult situations encountered in their work.

Thus, our discussion of work in communities of practice can inform our understanding of collective job crafting in organizations in several ways. First, the communities of practice literature provides ethnographic evidence that people actually enact their work collectively, through sharing stories, making sense of unexpected or unstructured work situations, and circulating the stories throughout the community as a collective memory of particular problems encountered in work and how to solve those problems. It also shows that actual practice in many communities of practice or organizations differs in significant ways from the formally documented practice. Along similar lines, the practice of many occupational communities is based in part on explicit knowledge subject to codification, and in part on implicit, skill-based knowledge, which is fluid, sometimes mysterious to outsiders (Van Maanen & Barley, 1984), and constitutes the enacted practice of the community.

Further, occupational groups exert a strong control over their members' behaviors (Van Maanen & Barley, 1984). According to Van Maanen and Barley, occupational control over work is exerted on two aspects of collective work: it dictates who is going to be a member of the occupational group and who is not, and how the content and conduct of members' work will be assessed. Thus, an occupational group's

control over its members' decisions on how to perform their work can be very powerful. Communities of practitioners shape in powerful ways their members' work practices (Lave & Wenger, 1991; Brown & Duguid, 1991). This is because the community provides individuals with an interpretive support necessary to make sense of work knowledge (Orr, 1990). The community of practice also controls individuals' work, by allowing or denying them full membership, contingent on members' ability to pick up invaluable task knowledge and learn the skills required for performing the full range of tasks from competent practitioners.

Finally, this literature provides interesting insights on the outcomes of engaging in the actual, noncanonical practice of the community. At the community level, the literature argues that engaging in the practice of the community leads to two important outcomes: innovation and reconstruction of the collective identity. First, through engaging in noncanonical practice, groups ignore precedent, rules, established scripts, and traditional expectations, and break conventional boundaries. Thus, they are more likely to engage in "enacting, a process of interpretive sense making and controlled change" (Brown & Duguid, 1991: p. 51), with positive consequences for innovation. The actual work enactment of the communities of practice drives innovation by allowing some parts of an organization, where the community emerges, to step outside the organization's limited world view and try something new. Second, crafting work in communities of practice has important consequences for the reconstruction of the collective identity of the workers. Members of communities of practice forge their own and their community's identity in their own terms, breaking out of the formal descriptions of their practice and thus shaping a collective identity on their own terms (Brown and Duguid, 1991). In telling stories about solving difficult work problems, members of the community are showing themselves as competent practitioners. In Orr's (1990) example of the work of technicians, the construction of identity occurs both in doing the work and in the stories technicians tell. Further, the stories of workers fixing the machines shape their collective identity and show the world what they consider to be the appropriate perspective on their work. This view of communities of practice as trying to forge their own identity and image, and control how they enact their practice is consistent with the discussion of work culture in the literature on

occupational communities (Van Maanen & Barley, 1984). Van Maanen and Barley suggest that the work culture of occupational communities is characterized by the desire of the community members to achieve occupational self-control over occupational matters, including the practice and the membership of the community.

At the individual level of analysis, the communities of practice literature illustrates what motivates individual members to participate in the collective crafting of the community's practice. Individual members gain essential "knowledgeable skill" (Lave & Wenger, 1991) through learning as active participants from more experienced members. The apprenticeship learning process of the newcomers in the community provides them with significant tacit knowledge about how to get the work done, by learning from the stories that the community members circulate among them. As newcomers learn the skills of the community's work, they come to construct new work identities for themselves as well. The reconstructed identity is about being a full practitioner in the community, which means showing others that the individual masters the full range of skills of the practice. For example, in the case of copy machine technicians, the reconstructed identity is defined by the ability to fix complicated machine problems they encounter in their work (Orr, 1990). The reconstruction of identity has been also documented in ethnographies of restaurant cooks (Fine, 1996). Cooks engage in processes of altering the image of their work roles, through a type of job crafting that Fine calls "repertoires" of meanings, which help making sense of who they are. For example, professional cooks see themselves as professionals, artists, manual laborers, businessmen, craftpersons, and even scientists. In this way, the cooks essentially draw on multiple identities at work to create meaning in their work and redefine their occupational identity.

Finally, the crafting that occurs in the communities' practices can have significant consequences for the organizations in which the communities are embedded. The literature does not provide empirical support for this claim, but suggests that alterations in work practices can lead to significant organizational innovation and even organizational change, through innovative, continuously developing practice (see Brown & Duguid, 1991, for a discussion). As Brown and Duguid (1991) further suggest, it is unfortunate

that in many organizations, people at the core of the organization regard the noncanonical practices, if they notice them at all, as counterproductive, without considering their potentially innovative consequences.

Shaping Routines in Work Groups. Group routines, as part of a group's customs, are everyday procedures used by group members in their work (Levine & Moreland, 1991). A classic example is offered by Roy (1955), who documented how a work group developed routines (e.g., "times" and "themes") to overcome the boredom and monotony of repetitive work in extra-long work days. For example, workers created interruptions called "peach time", "banana time", or "window time" that served to initiate verbal exchanges, making fun, serious conversation, along with the sharing of food and drinks, to occupy members' attention with witty and animated joking and provide intellectual content until the next break.

The way groups enact routines can shed light on the collective job crafting processes that take place in work groups. For example, research shows how groups establish particular routines to deal with time allocation issues among several tasks. Waller (1997) found empirical evidence that groups engage in two types of multitasking behavior to allocate resources and deal with multiple tasks. Some groups will engage in time sharing, where the group distributes tasks to group members, resulting in the simultaneous performance of multiple tasks. Other groups will time swap, or have all members first perform collectively one task, then go to the next task together, until they complete all the tasks they have to perform.

Gersick and Hackman (1990) pointed out that groups, as any organized social systems, need to develop at least some routinization of behavior to get work accomplished. This is because group members need to be able to anticipate others' behaviors such that they could coordinate action. Routines help groups achieve this predictability, by giving members a behavioral script to follow. For example, Cohen and Bacdayan (1994) found evidence that task performing groups develop routines and store them in the group's procedural memory, which has a low decay rate. Their finding that the passage of time did not affect task performance that was based on routines suggests that group routines tend to be relatively stable

over time. Other empirical work also suggests that groups develop routines that have a strong tendency to become group habits and persist over time. Hackman and Morris (1975) found experimental evidence that groups – when asked to perform creative tasks – settled immediately into performance routines that guided the groups' subsequent behavior during the performance of the task. Similarly, Gersick (1988) found that project groups exhibited persistent habits of behavior, or "habitual routines", which governed the groups' tasks, internal processes, and interactions with outsiders.

Groups may enact their routines in different ways. As suggested above, some groups may develop fairly stable routines quickly, and enact the same routines in their work over time and in changing circumstances. Other groups seem capable of breaking "habitual routines" and finding new ways of performing their tasks. Some other groups develop "meta-routines" (Gersick & Hackman, 1990) that prompt the group members to initiate their own review of habitual routines on a regular basis, to see whether they are functional or dysfunctional for the group's performance.

What prompts some groups or group members to change their routines and what makes others persist in using previously established routines? Pure inertia due to the fact that routines tend to become automatic and self-sustaining, and the perceived costs of changing existing group routines may play a role in a group's decision to stick with its current routines or change them (Gersick & Hackman, 1990). Some of the costs involved in changing routines may be the time required by group members to learn new routines, the time needed to convince all group members of the superiority of the new routines, and certain political costs (because group members may perceive any explicitly proposed change as a way to undermine their control over work).

Further, groups may alter their existing routines to create more interesting work, to reduce members' boredom with the work, to promote group cohesiveness, to express certain attitudes toward outsiders to the group, or to improve the group's performance (Roy, 1955; Zurcher et. al., 1966; see Levine & Moreland, 1991, for a discussion). Further, time may play a role in a group's decision to stick with its current routines or change them (Gersick, 1988; 1989), with groups more likely to change their existing way of doing things at particular time points associated with milestones in the group's work.

Levine and Moreland (1991) suggest that group norms may be powerful conduits of group routines, when group members conform to those norms. It is long known in the social psychology research that groups can exert strong normative influences on their members, conducive to member conformity (Roethlisberger & Dickson, 1939; Asch, 1951; Barker, 1993). Hackman and Morris (1975) suggested that many groups actually have a "meta-norm", rarely articulated, that basically states that group members should not explicitly discuss their first-level norms. According to this view, group members will be unlikely to question and suggest spontaneously that the group examine its current behavior and routines, and evaluate the possibility of enacting superior task strategies.

However, group norms may also permit or even encourage dissent (Coser, 1962; see also Levine, 1989 for a discussion). Levine (1989) suggested that group norms permitting or encouraging deviance may arise from several sources, such as members' desire to uphold a value system that guarantees freedom of expression, to develop creative solutions to group problems, or to demarcate the boundaries of tolerable behavior within the group. There is evidence, for example, that group norms that support originality affect individuals' tendency to exhibit original task performance. Moscovici and Lage (1978) explored groups where some members (confederates) gave "green" responses to blue slides and manipulated the strength of the originality norm within the group. They found that individual members tended to give more original ("green") responses to the blue slides as the strength of the group originality norm increased. Work groups whose climate is characterized by the existence of clear group objectives, a nonjudgmental and supportive atmosphere for individual suggestions, commitment to excellence, and norms that favor innovations, are more likely to adopt innovations (West, 1990).

Similar insights are provided by the group learning literature that focuses on the behavioral, interpersonal aspects of learning (Edmondson, 1999; Argote, Gruenfeld, & Naquin, 2001). This research has conceptualized group learning as a process in which the group takes action, reflects upon feedback, and makes changes to adapt or improve. While learning does not equate job crafting, some of the behaviors that constitute learning can be thought of as forms of job crafting (e.g., finding out ways to improve work processes, which may entail breaking established work routines). This research has found

empirical evidence that teams are more likely to engage in learning behaviors (that include taking risks in the team) when they have a higher level of psychological safety and team efficacy (Edmondson, 1999), and when the power perceptions in the team do not create a fear of speaking up (Edmondson, 2002). These findings suggest that group norms that support innovation or experimentation of group members are likely to foster individuals' job crafting behaviors.

Shared mental models among the group members may also play a significant role in a group's enactment of its routines, particularly because shared mental models reflect the level of agreement among group members on issues related to the group's tasks, interaction processes, equipment, and members (Cannon-Bowers et. al., 1993).

The literature on newcomer innovation in work teams provides further insights on the factors that affect a group's likelihood of accepting and implementing innovation in its processes or ways of performing its tasks (Levine, Choi, & Moreland, 2003; Choi & Levine, 2003; Levine & Moreland, 1999). For example, a work group is more likely to accept new ideas when the prior performance level of the group was low and the group did not have a choice in determining the group's prior task strategy, than when the prior performance was high and the group had a choice in determining the task strategy used before (Choi & Levine, 2003). Open work groups – those with high levels of membership change and personnel turnover - are likely to be more receptive to new ideas (Ziller, Behringer, & Goodchilds, 1960). Work groups experiencing turnover are more likely to adopt a newcomer's new task routine when they share a superordinate social identity with that member and the new routine is superior to their own routine (Kane, Argote, & Levine, 2005). Because groups develop more complex and stable relationships over time, it is also likely that work groups in earlier stages of development are more likely to adopt innovations (Levine, Choi, & Moreland, 2003). Further, work groups are more likely to adopt innovations suggested by newcomers when they have a democratic leadership (Levine, Choi, & Moreland, 2003). There is also evidence that relational similarity between a newcomer and the rest of the group predicts the extent to which the newcomer is successful at introducing innovations in the work group's processes, because the group is more committed to a similar newcomer than to a dissimilar one (Levine, Moreland,

& Choi, 2001). However, in some situations, more dissimilar newcomers are more likely to possess unique, distinct skills or resources, which make them more likely to be successful in introducing innovations.

Research on reactions to deviance in groups also provides insights on factors that may affect an individual's deviant behavior in the group. Several studies have shown that individuals who interfere more with the group's locomotion toward valued group goals and those who are perceived as more responsible for this interference are less liked by the group (see Levine, 1989 for a review). However, Hollander (1958) proposed and found support for the idea that individuals are allowed by the group to deviate when they initially conformed to the group and demonstrated competence on the task, which gave them status in the group or "idiosyncrasy credits". Further empirical research found that high status individuals who deviated were more severely punished by the group the higher their interference with the group's goal attainment, and were highly rewarded for facilitating the group's goal (Wiggins et al. 1965). However, as Levine (1989) noted, in these studies deviance was unambiguously "bad" for the group, involving over disruption of the group's performance. It may be that "good" deviance than helps the group, such as innovation, may be accepted or even demanded from high status individuals.

Finally, the literature on group socialization argues that individuals in their maintenance phase of group membership ("full members" in the group) go through a process of "role negotiation" (Moreland & Levine, 1982) where the group and the individual negotiate about functional roles in the group (e.g., leadership role). This role negotiation process suggests that individuals will be more likely to craft their work when the group allows them to do so, which may be a reflection of how much the group is committed to the individual member (Moreland & Levine 1982; Moreland, Levine, & Cini, 1993). If the group is more committed to the individual, it will be more likely to allow him or her to exercise more freedom in shaping work routines, because the individual is perceived as more valuable to the group and more likely to be trusted (Moreland & Levine, 2002).

In sum, previous research suggests that job crafting cannot occur in group contexts without a negotiation process between the individual and the rest of the group, who will ultimately react to the

individual's actions and allow him or her to craft work. Changing group routines is not an easy process, and several individual and group factors can influence the success of individuals' attempts to introduce new work routines in a group context. Further, as indicated by empirical evidence summarized, changing group routines has important consequences for individuals, the group, and the organization as a whole. For individuals, it can create more interesting work, reduce boredom, or facilitate the individuation of workers (Roy, 1955; Zurcher et al., 1966). For the group, changing group routines may positively impact task performance, flexibility, cohesiveness, and coordination when previous dysfunctional habitual routines are discarded and replaced by superior routines (Gersick & Hackman, 1990), but may also negatively impact a group's goal achievement, as indicated by research on opinion deviance in groups. Finally, these performance effects at the individual and group level may translate to positive or negative consequences for organizational performance.

Organizational Improvisation. Prior management research has explored the occurrence of improvisation at different levels of analysis, but most of the work in this area has been at the collective (group, department, organization) level. Weick (1993) documented individual improvisation when he described the individual actions of a firefighter creating an escape fire to save his life in the Mann Gulch disaster. At the group level, Hutchins (1991) explored how the crew of a ship whose navigational system had broken developed new routines in real time to make their way to the harbor. Hutchins noted that in this process, no crew member understood the complete system they improvised, but their collective actions enabled them to achieve their goal. Miner et al. (2001) described product development teams that broke routines and came up with new product features as they went along, without going back to the drawing board. Along similar lines, Orlikowski (1996) documented how customer support specialists in a software company engaged in everyday improvisations and slippages when adopting a new technology, which facilitated a slow transformation of organizational practices.

Researchers have used diverse terms to describe the forms that improvisation takes in organizations. Weick (1993), borrowing Levi-Strauss's (1966) bricolage, argued that individuals successful at improvising are bricoleurs, or people able to create order out of whatever materials they

have at hand. Miner et al. (2001) document three different types of improvisati on, depending on the direct outcomes observed. “Behavioral productions” occur when new behaviors are observed, for example when a development team, which was required to visit stores that sold products similar to their own, changed its behavior during one trip to include stores selling products that were dissimilar in content but similar in packaging. “Artifactual productions” occur when new physical structures are created without prior design, such as in the case of a team of design engineers who were cond ucting a series of product tests and realized that the product’s safety and performance would be enhanced by adding a cover. As a result, the engineers improvised a mock-up cover not in the product’s plans. Finally, “interpretive productions” occur when new interpretive frameworks are created, such as in the case of a product development team that, building on an insight of an engineer team member who reported that fixing a bug in the system created an unanticipated improvement in speed, turned the program error correction into a speedy feature that could be emphasized in marketing efforts. Thus, the team created a shift in interpretation, by reframing the meaning of the unexpected event in a novel way and infusing the prior event with a new meaning (Miner et al., 2001).

The literature on improvisation is grounded in the premise that organizational improvisation, under the right circumstances, leads to innovation and change (Vera & Crossan, 2004). However, as opposed to other perspectives on organizational change that view change as a discrete event to be managed separately from the ongoing processes of organizing, organizational improvisation builds on the situated change perspective (Orlikowski, 1996), where change is “enacted more subtly, more slowly, and more smoothly, but no less significantly. Such organizational transformation is grounded in the ongoing practices of organizational actors, and emerges out of their (tacit and not so tacit) accommodations to and experiments with the everyday contingencies, breakdowns, exceptions, opportunities, and unintended consequences that they encounter” (Orlikowski, 1996: p. 65). Therefore, the micro actions that individuals and groups take to make sense of their world and act coherently are the center of the organizational improvisation perspective.

The notion of ongoing improvisation as a way to enact work practice in organizations resonates with the focus on situated action by practice researchers (Hutchins, 1991; Lave, 1988). Hutchins (1991), for example, argued that organizational transformation is achieved not by conscious reflection, but by local adaptations. Therefore, improvisation informs our understanding of job crafting in organizations by suggesting that "to understand organization is to understand organizing" (Weick, 1998: p. 551), or that action emerges in organizations through the micro-practices of individuals who enact their work as opposed to previously specified plans.

The improvisation literature has mostly been focused on the process rather than the outcomes of improvisation (Vera & Crossan, 2004). This focus resonates with the idea that emphasis on performance as outcome places a great pressure on improvisational processes within organizations. Since improvisation is spontaneous and creative, it is unpredictable, and therefore individuals are less likely to engage in improvisation when they know they will be evaluated based on the product of their actions rather than by the process of attempting to take advantage of an opportunity or to solve a problem. Regarding the process of improvisation, scholars have suggested that experimental culture (Crossan & Sorrenti, 1997) and minimal structure (Cunha, Cunha, & Kamoche, 1999) are conditions for improvisation processes to occur in organizations. An experimental culture promotes improvisation because it emphasizes values and beliefs that promote action and experimentation, as opposed to reflection and planning, and tolerates mistakes (Cunha, Cunha, & Kamoche, 1999). Minimal structure promotes improvisation when it does not stifle individuals' attempts to experiment in their work, but provides milestones or action deadlines and clear goals, to realize the potential of improvisation (Cunha, Cunha, & Kamoche, 1999).

Regarding the outcomes of improvisational processes, research has found both positive and negative effects on performance. For example, Weick (1993) found that individual improvisation of a firefighter had positive effects for the individual, by helping him survive the fire. Improvisation can also result in increased motivation to work and to improvise, because its iterative nature provides high levels of individual feedback, thus contributing to motivational increases (Crossan & Sorrenti, 1997; see also

Cunha, Cunha, & Kamoche, 1996). Miner et al. (2001) found both positive and negative effects of improvisation in product development teams. Generally, improvisation improved short-term learning and performance, because improvisational attempts were tightly linked to the specific local problem to be solved and the particular moment in time when the problem occurred, and resulted in local and time-bounded performance improvement. However, improvisation had both positive (e.g., when an improvised circuit board design was retained in future production) and negative (e.g., when improvising actions distracted a team from the original plan for the product and created knowledge that was not integrated well with other activities) effects on long-term learning. Finally, improvisation has been theorized to have positive consequences for an organization's memory (Moorman & Miner, 1998), because improvisational outcomes are retained in an organization's memory for future use. This may explain the positive and negative potential consequences of improvisation, because prior improvisational outcomes retained in organizational memory may be generalized into solutions that make no sense in circumstances other than those where they were first conceived.

2.3 UNRESOLVED ISSUES RELATED TO JOB CRAFTING

2.3.1 Content of Job Crafting

Previous work has suggested that job crafting behaviors can affect three types of work boundaries (see Table 1). Although the literature has described to some extent how individuals can alter these work boundaries, most of the work is only based on anecdotal evidence and a few qualitative studies. Moreover, a simultaneous examination of all job facets (tasks, relationships, and meanings) has not been pursued in previous research (see Wrzesniewski & Dutton, 2001, for qualitative work on this issue). First, individuals may shape their tasks, in terms of content, number, duration, or sequence. These changes may be in the direction of expanding one's job to include additional responsibilities, but also in the direction of narrowing one's job to the minimum necessary to get the job done. Second, people can alter the number

and nature of the relationships they have with others while they carry out their work. Finally, individuals can shape the cognitive boundaries of their work; for example they can view work as a set of discrete tasks or as a whole piece, or they can view it as a trivial piece or as having broader significance for others, the organization, or society. A job crafting perspective on work will allow researchers to understand what people actually do at work and thus build theories based on a rich understanding of work (Barley, 1996; Barley & Kunda, 2001). For example, Barley (1996) notes that although many scholars acknowledge that service and knowledge work will have far reaching implications for organizations, few have explored these implications in part because there is no data on the content of this types of work (e.g., how service jobs differ from industrial jobs, or how service jobs differ from each other).

Further, we still need to learn how these three facets of job crafting affect one another. Presumably, the three facets of job crafting interact with one another. For example, people who take on additional tasks will be more likely to interact more frequently with certain people, or to interact with people with whom they would not interact if they did not take on those additional responsibilities, because they will probably need to coordinate their work with the work of others. Moreover, individuals who craft their relationships by interacting more frequently with certain groups of people will be more likely to alter their tasks, in part because they could learn different or superior ways of doing the same tasks from those people, or because the people they interact with can help them by taking on part of their own tasks. Finally, individuals who alter their tasks or relationships at work will be more likely to perceive their work in different ways. Those who take on additional tasks may see their work as more meaningful and significant, because it includes broader responsibilities. Those who interact more frequently with others or with more diverse groups of employees may see their work as affecting in more important ways other people's (e.g., co-workers') work or others' (e.g., customers') life. Further, new technologies implemented in organizations are important triggers of changing organizational routines (Barley, 1986; Tyre & Orlikowski, 1994; Von Hippel, 1994; Szulanski, 2000), altering not only individuals' ways of doing their work, but also the patterns of sharing knowledge between individuals in teams. For example, the implementation of CT scanners in hospital settings altered interpersonal "scripts"

governing the interaction between physicians and technicians (Barley, 1986), and a new technology for cardiac surgery implemented in several hospitals led to changes not only in individual team members' tasks (e.g., surgeon, nurse, perfusionist), but also in role boundaries and team interdependence such that the surgeon's role shifted from that of an order giver to a team member (Edmondson, Bohmer, & Pisano, 2001).

Finally, we still need to learn how one individual's job crafting affects others in his or her work group or the organization. Individuals work in collective, social settings, such that in most work contexts individuals will be more or less interdependent with others in their work. For example, nurses' work affects in significant ways the work of doctors. Nurses who shape their tasks to include paying enhanced attention to important cues from the patients and the context of care may provide doctors with important, critical information that can alter diagnostics and treatments, thus affecting doctors' work in significant ways. Manufacturing workers who shape their own task routines in ways that differ from the formal task design may impact in significant ways what others in their work group do, because of the interdependencies in the content and sequences of tasks they perform as a team. Cleaners' relationships with patients and visitors may positively affect patients' affective moods, which in turn are likely to influence the nature of the relationships between patients and the doctors who see them, altering doctors' work. Cleaners' more frequent interactions with nurses may also result in smoother and easier work for nurses (Wrzesniewski & Dutton, 2001).

2.3.2 Precursors of Job Crafting

Previous theoretical work has suggested some potential antecedents of job crafting, such as an individual's motivation to craft as reflected in the specific needs for control over work and work meaning, positive self-image, and social connection with others (Wrzesniewski & Dutton, 2001). Wrzesniewski and Dutton argued that individuals need to assert some control over their jobs to avoid alienation from the work they do (Braverman, 1974). By taking control over the tasks they perform, even in small ways, job crafters make the job their own. Further, when facing jobs that make the construction of a positive sense

of self difficult, individuals -- in their drive to create and sustain a positive self image (Baumeister, 1982), -- will try to change aspects of their jobs to remedy the situation. For example, workers performing work that is devalued by society (or even stigmatized) alter the cognitive boundaries of their work, by infusing work with positive value or increased significance (Ashforth & Kreiner, 1999). Ashforth and Kreiner cite qualitative evidence supporting this claim -- for instance, showing how public defenders assert they are protecting the constitutional rights of all citizens to a fair trial, not helping law offenders beat the system. Finally, people are motivated to establish connections with others as a way to introduce meaning in their lives (Baumeister & Leary, 1995), thus they are more likely to craft relationships at work that satisfy their need for social connection.

Earlier theoretical work on role development has also suggested that individuals' desire for control and feedback are potential antecedents of shaping one's role (Nicholson, 1984). Some of the previous work has also suggested that autonomy or discretion over work may be an important predictor of job crafting (Nicholson, 1984; Ilgen & Hollenbeck, 1992). Other job features such as task interdependence with others at work and the degree of monitoring have been proposed, but not studied, as potential antecedents of job crafting (Wrzesniewski & Dutton, 2001). Finally, a "calling" orientation toward one's work (i.e., one's relation with his or her job that is focused on enjoyment of fulfilling, socially useful work; Wrzesniewski, McCauley, Rozin, & Schwartz, 1997) and an intrinsic motivational orientation (i.e., doing the work for its own sake; Amabile, Hill, Hennessey, & Tighe, 1994) have also been suggested as potential antecedents (Wrzesniewski & Dutton, 2001).

Empirical work on the antecedents of job crafting lags well behind theoretical work. Most of the work has been done on the antecedents of other constructs, such as organizational citizenship behaviors. For example, empirical evidence across a large number of studies supported four types of variables as antecedents – several job attitudes, leader behaviors, task variables, and, to a lesser extent, dispositions (see Podsakoff et. al., 2000 for a review). Regarding behaviors that are closer to the conceptualization of job crafting in this dissertation, there is much less research on potential antecedents. There is some evidence that individuals who have increased job autonomy are more likely to exhibit a proactive role

orientation (Parker, Wall, & Jackson, 1997) and that hierarchical position positively influences the extent of task revision (Staw & Boettger, 1990). Parker, Wall, and Jackson (1997) found that manufacturing workers who experienced increased work autonomy developed more flexible role orientations (defined as changes in how employees see their roles; those with flexible role orientation viewed their jobs more broadly by experiencing ownership and responsibility for work beyond their immediate operational tasks, and awareness of the importance of acquiring and using a wide range of skills and knowledge to enable them to contribute at a broader level). Further, Staw and Boettger (1990) studied students who were asked to revise the content of a promotional brochure that included several accuracy and grammar deficiencies. The researchers found that being in a hierarchical position fostered task revision. Further, there is some qualitative evidence that individuals in certain occupations where the public perception of the status and meaning of work is ambiguous or negative are more likely to engage in cognitive processes of reshaping the image of their work roles (Fine, 1996; Ashforth & Kreiner, 1999), with the purpose of justifying or legitimizing their work and constructing a positive identity.

Finally, most of the prior work on job crafting behaviors has largely ignored the relational context of work and how it influences individuals' decisions to craft their work. As suggested by the literatures on communities of practice and small groups, the relational context of work is an important factor that can affect the extent to which individuals shape their jobs in different ways at work. Although initiated by individuals, job crafting behaviors are influenced by the actions of people working together in work groups, such that the context of work (both structural and relational) can matter to a great extent in shaping these behaviors (Mowday & Sutton, 1993; Rousseau & Fried, 2001).

In conclusion, there is much to be learned about the factors that drive the extent to which individuals engage in job crafting. Based on the review of existent research, further work is therefore needed to shed light on the antecedents of job crafting behaviors in organizations.

2.3.3 Outcomes of Job Crafting

Existent research on the outcomes of job crafting is even scarcer than research on its antecedents. Theoretical work has suggested that job crafting may positively affect one's meaning of work and work identity (Wrzesniewski & Dutton, 2001), individual outcomes (Nicholson, 1984), or organizational performance (Staw & Boettger, 1990). Wrzesniewski and Dutton (2001) pointed out that job crafting changes the meaning of one's work because the shaping of tasks and relationships at work allow s the individual to experience the work differently, and therefore reframe the purpose of their job. Any actions that individuals take to increase the feelings of purpose at work are thus likely to change the meaning of work. For example, hospital cleaners may craft their jobs by including additional tasks or timing their work to be more efficient in regard to the workflow of their unit. In this ways, cleaners alter the meaning of their work, by seeing themselves as critical in healing patients rather than simply cleaning the rooms. Similarly, cleaners may craft their relationships by engaging in interactions with patients and visitors, thus changing the meaning of work to be helpers of those sick rather than just cleaners of their rooms.

Nicholson (1984) noted that role development – which occurs when a person tries to change role requirements so that they better match his or her needs, abilities, and identity – has the potential to increase individual satisfaction (derived from a sense of one's own capacit y for innovation and reform) and learning on the job (through experimentation, feedback, and change). Although Staw and Boettger (1990) did not explore the outcomes of task revision, they implied that individuals who revise their tasks to correct a faulty procedure or inaccurate job description can be immensely valuable to their organization, by eliminating a source of dysfunction.

However, there is considerable empirical work on the individual and collective outcomes of organizational citizenship behaviors and contextual performance (MacKenzie, Podsakoff, & Fetter, 1991; Podsakoff & MacKenzie, 1994; Podsakoff, Ahearne, & MacKenzie, 1997; Podsakoff et. al., 2000). The existent research has found support for two types of outcomes – more favorable performance evaluations of individuals, and organizational performance (Podsakoff et. al., 2000). In summarizing the empirical

findings across a large number of studies, Podsakoff and colleagues concluded that organizational citizenship behaviors and contextual performance behaviors have a positive effect on performance evaluations, and that this effect on evaluations is at least as great as the effect of in-role performance. Considerable support was also found for the positive effects of organizational citizenship behaviors and contextual performance on organizational effectiveness, supporting Organ's (1988) fundamental assumption that organizational citizenship behavior is related to performance.

Qualitative work has found some evidence that individuals' enactment of their jobs predicts smooth work and project completion (Fletcher, 1998; Star & Strauss, 1999) and serves broader organizational performance goals (Worline, Wrzesniewski, & Rafaeli, 2002). For example, design engineers engaging in additional tasks (e.g., taking extra work in order to get a task done, connecting people to resources) and relationships with others were able to create smoother work and move their projects toward completion (Fletcher, 1998). A graphic designer's courageous act of telling superiors that their direction for packaging and advertising of the product was not good, and her subsequent decision to change the design positively affected the company's performance (Worline, Wrzesniewski, & Rafaeli, 2002).

Finally, it may be that job crafting has different consequences for individuals, work groups, or organizations, depending on specific contextual factors. In particular, it may be that the effects of job crafting depend on the extent to which job crafting aligns or not individual work patterns with work group and organizational goals (Wrzesniewski & Dutton, 2001). For example, when an individual crafts her job in ways that are at odds with work group coordination processes (such as changing the task sequences or pacing), crafting may have negative effects on group effectiveness. Further, it is likely that one individual's job crafting interacts with others' similar behaviors at work, with potential consequences for the performance of the job crafter and others. Situational variables such as task characteristics, the nature of task knowledge, or other organizational variables may influence the consequences of job crafting. In sum, there is still much to be learned about the consequences of job crafting behaviors in organizational settings.

3.0 THEORETICAL MODEL

This chapter begins with an outline of job crafting as it is conceptualized in this dissertation. I will then describe the theoretical model that will be tested in the study, and will develop the propositions relative to the relationships indicated in the model.

3.1 JOB CRAFTING

Job crafting – defined in this dissertation as the way in which individuals shape the task or relational boundaries of their work – is a creative process that is not necessarily focused on creative outcomes, bu t on how individuals take action to enact their jobs in ways that fit their motivation, skills, and interests better (Wrzesniewski & Dutton, 2001). Job crafting behaviors are not part of any formal job description, and are not necessarily consistent with the management's image of the ideal employee. In case they are positive, functional behaviors, aimed at improving existing tasks and processes, they may actually not be recognized by management or others at work as superior to other ways of performing the t asks. In this dissertation, I build on this prior conceptualization of job crafting at the individual level, and explore potential structural and collective influences on job crafting.

As described in Chapter 2, what distinguishes job crafting from other r elated constructs in the previous literature (task revision, Staw & Boettger, 1990; proactive role orientation, Parker, Wall, & Jackson, 1997; organizational citizenship behavior, Organ, 1988; role innovation, Schein, 1971; role development, Nicholson, 1984) is that job crafting (1) includes both behaviors or actions the individual engages in, and cognitions or beliefs about work meaning and one's work identity and (2) refers to

multiple work boundaries (task, relational, and cognitive meanings). Contrasting job crafting to job design (Hackman & Oldham, 1976) and social-information processing (Salancik & Pfeffer, 1978) approaches, Wrzesniewski and Dutton (2001) emphasized the idea that how individuals perform their jobs is not a passive reaction to the design of the work or to coworkers' social cues about work, but is to a great extent a function of the individual performing that job. Job crafting views employees as creators of the motivational potential of their jobs, such that (1) job elements that traditionally compose the design of the job and thus are externally determined, are internally shaped by employees' behaviors; and (2) people do not simply interpret and react to cues offered by their job and social context, but rather actively enact their jobs in new ways that reflect individual preferences and understandings.

3.1.1 The Facets of Job Crafting

As suggested in Table 1 in the previous chapter, job crafting has been conceptualized or empirically explored along three main dimensions – tasks, relationships, and meanings. Most of the previous related conceptualizations however have taken only one facet (the task; e.g., task revision, organizational spontaneity, personal initiative, and taking charge), or two facets (tasks and relationships; e.g., articulation work, background work, relational practice), but in many cases one of the facets is not explicitly considered (e.g, organizational citizenship behavior, prosocial organizational behavior, contextual performance). Some recent theoretical and empirical approaches have acknowledged that individuals actually can shape their work along the three dimensions of tasks, relationships, and meanings (e.g., relational practice, courageous behavior, job crafting). However, this work is either qualitative or theoretical.

The task facet of job crafting refers to activities that can shape the content, number, or scope of the job tasks one performs at work. People may choose to expand or reduce the scope of their tasks by taking on more responsibilities or doing only the minimum that is necessary to get their work done, change the number of tasks they perform to carry out their work, or alter the routines by performing the same tasks in different or novel ways. All the job-related task aspects that differ in any way from the

prescribed tasks can be forms of task crafting. The relational facet of job crafting captures how people enact the relationships they engage in to carry out their work. This facet may include any instances when individuals shape the quality and amount of interaction with others at work (Wrzesniewski & Dutton, 2001), or any instances when they shape with whom they choose to interact at work. For example, the job description may require people to interact with some others to get the work done. However, different individuals may choose to interact more or less frequently with some people, and their relationship closeness may range from very close to very distant ties, depending on personal preferences and needs. It may also be that people choose to establish more frequent or closer ties with members of certain occupational groups in the organization than with members of others. The cognitive facet of job crafting refers to how one sees the job, for example seeing the job as a set of discrete parts, or as an integrated whole (Wrzesniewski & Dutton, 2001).

3.2 THEORETICAL MODEL AND PROPOSITIONS

As indicated in Chapter 2, although prior research has not examined the antecedents and consequences of job crafting as defined in this dissertation, there has been some research on its components. Some quantitative work generally focused on one facet of job crafting and its potential antecedents (e.g. task revision, Staw & Boettger, 1990), or on both antecedents and consequences (organizational citizenship behavior, Bateman & Organ, 1983; MacKenzie, Podsakoff, & Fetter, 1991). Some qualitative work focused on the nature of job crafting or its outcomes (Fletcher, 1998; Star & Strauss, 1999; Worline, Wrzesniewski, & Rafaeli, 2001; see also Wrzesniewski & Dutton, 2001). Drawing on prior research, I develop a model of job crafting in organizations and offer propositions relative to suggested relationships between variables. The focus of the present study is on the structural and relational factors as potential antecedents of job crafting, the content of job crafting, and its outcomes.

Prior theoretical work (Wrzesniewski & Dutton, 2001) has suggested that individual needs and work orientation are expected to influence the extent and nature of individual job crafting. Thus, drawing

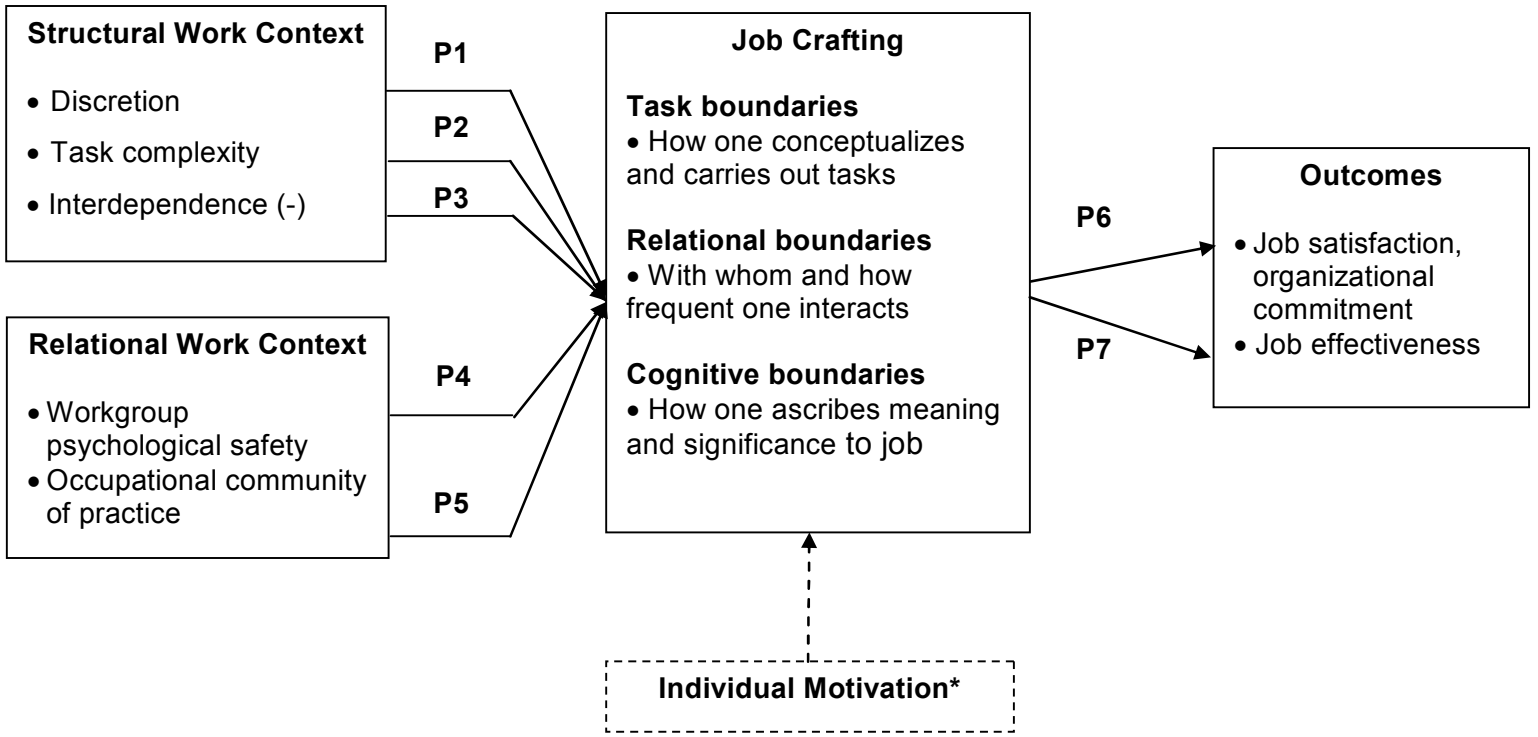
on the existent body of work, I acknowledge that individual factors such as need for uniqueness (Snyder & Fromkin, 1980), need for control over job and work meaning, need for a positive self-image, need for human connection with others (Wrzesniewski & Dutton, 2001) or other human needs are potential contributors to one's engagement in job crafting at work. However, it is not my intent to either challenge or confirm these claims, but instead offer a model that suggests that the work context (through structural and relational aspects) and the nature of the task explain variance in the extent and nature of individuals' job crafting. Certainly, individual difference factors can play an important role in individuals' decision to engage in job crafting behaviors. Therefore, I will briefly outline some motivational factors at the end of the section on antecedents of job crafting.

The importance of the structural and relational context in influencing job crafting is suggested by previous work on individual innovation in organizations. More specifically, researchers have suggested that innovation is a process that involves not only the generation of new ideas in work, but also the implementation of these ideas (Axtell et al., 2000; Caldwell & O'Reilly, 2003). Whereas the generation of new ideas in doing work is mainly a function of individual and job structure characteristics, their actual implementation in work practice is heavily dependent on the social and organizational context (Van de Ven, Angle, & Poole, 1989). For example, it has been found that the suggestion of new ideas was more strongly related to individual and job characteristics than to group and organizational characteristics, whereas the implementation of these ideas in work was more strongly related to group and organizational characteristics (Axtell et al., 2000).

The structural context of work exerts constraints (e.g., monitoring employees' work) or offers opportunities (e.g., employee autonomy) for individual job crafting. The relational context of work is likely to shape the form that job crafting behaviors take, because the social context is a strong predictor of how individuals perceive their work and behave in the workplace (Pfeffer & Salancik, 1978), and interpersonal sensemaking processes inform the meaning of one's work (Wrzesniewski, Dutton, & Debebe, 2003). Therefore, both the structural and relational context of work are likely to exert a strong

influence on the extent to which individuals try to actively shape the boundaries of their work through job crafting.

In Figure 1 I propose a general model of job crafting. Specifically, the model proposes that the work context (reflected in structural and relational influences) affects one's level and nature of engagement in job crafting. The model also specifies motivation as a driver of job crafting, but no specific propositions are offered for this part of the model (which is not part of the research in this dissertation). The model also proposes several outcomes of individual job crafting.



Note: Individual motivation is not the focus of this study. Therefore, no specific hypotheses are offered or tested for the effects of individual motivation on job crafting.
* Individuals may differ in their need for uniqueness, control over work, positive self-image, connection with others, challenge in work, closure, with potential implications for job crafting behaviors.

Figure 1 Proposed Model of Job Crafting

3.3 ANTECEDENTS OF JOB CRAFTING

Given the focus of this dissertation described previously, in this section I analyze the relationship between structural and relational factors and job crafting behaviors. Since motivation to job craft was suggested in previous theoretical work as potential antecedent (Wrzesniewski & Dutton, 2001), I will also briefly discuss some potential motivational factors that can influence individuals' job crafting behaviors.

3.3.1 Work Context Influences – Structural Factors

Discretion. Previous work on job crafting has suggested that control over work should be positively related to the extent to which individuals engage in job crafting. Theoretically, job crafting should be fostered by a sense of discretion that employees have in what they do in their jobs and how they do their jobs (Wrzesniewski & Dutton, 2001; Warren, 2003). Discretion offers more degrees of freedom in how individuals go about performing their jobs. Staw and Boettger (1990) suggested that task revision, which they defined as "taking action to correct a faulty procedure, inaccurate job description, or dysfunctional role expectation" (p. 537), might be encouraged by work practices such as job enlargement and work participation schemes, because of the associated increased responsibility and empowerment of employees. Along similar lines, Ilgen and Hollenbeck (1992) pointed out that individuals are more likely to create emergent task elements in their roles in organizations when the job gives them freedom to choose the tasks and procedures they perform. Discretion in work determines the scope of role innovation because people having jobs characterized by high levels of freedom over work "lack adequate data on which to base conformity" (Nicholson, 1984: p. 178).

However, empirical evidence lags behind theoretical insights on this issue. For example, Staw and Boettger (1990) found experimental evidence that task revision is positively related to hierarchical position in the organization, suggesting that increased discretion in work will lead to more task revision, because hierarchical level is positively related to the level of one's discretion in work. Studies of proactive role orientation have found empirical evidence that job autonomy, which is associated with

more discretion in work, predicted proactive role orientation of employees – or people's beliefs about the boundaries of their specific work roles, a cognitive form of crafting (Parker, Wall, & Jackson, 1997).

Discretion over work enables an individual to adapt work elements to his or her skills and preferences, and creates a sense of responsibility and ownership in work (Ashforth & Saks, 2000). Thus, increased discretion in work should facilitate psychological involvement in work in both the task and relationship sides of one's job. People who have increased discretion in how to carry out their jobs will experience more psychological empowerment (Spreitzer, 1995, 1996) and self-efficacy (Bandura, 1982), and therefore are more likely to achieve a sense that their work is more significant or meaningful for the organization. Increased discretion in work provides people with psychologically positive opportunities to try new ways of doing their work, because it gives them a sense of freedom in what they do and how they do their work, and a sense of ability or means to act in certain work situations (Spreitzer & Sonenshein, 2003). Thus, based on the above, I propose the following:

> ***Proposition P1:*** *Individual discretion in work will be associated with higher levels of job crafting behaviors.*

Task Complexity. The nature of the task performed by individuals may facilitate or impede job crafting. Task complexity refers to the difficulty or ease involved in completing the task. It has been operationalized as the degree of complexity in the search processes, the amount of thinking time required to complete the task (Perrow, 1967), or the extent to which the task processes have knowable outcomes (Thompson, 1967; Burns & Stalker, 1961). Other researchers have looked at the task uncertainty to characterize tasks that are both difficult and variable (Van de Ven, Delbecq, & Koenig, 1976). Task variability refers to the degree to which the task changes over time and has been operationalized as the number of work exceptions encountered in work (Perrow, 1967). Other researchers (Wood, 1986) have argued that task complexity describes the relationships between task inputs (e.g., required acts and information cues in the task) and therefore reflects component, coordinative, and dynamic complexity aspects.

Tasks that are more complex place increased demands on the knowledge, skills, and resources of individual task performers. Further, tasks that are more complex require more extensive exploration activities, because there is more uncertainty involved in how to complete them and what results will be achieved (March, 1991). Complex tasks are associated with greater use of personal and group coordination modes, such as feedback and mutual adjustment, and group meetings, to deal with the uncertainty and variability inherent in the task (Van de Ven, Delbecq, & Koenig, 1976). When tasks are more complex, individuals need to make adjustments in their tasks strategies to accommodate the complexity they encounter in their tasks. For example, they need feedback from task performance to make decisions on whether they need to modify the task strategies they use to complete the task. Sometimes they may adopt a trial-and-error approach in which they make small changes in task procedures and learn from the feedback they get by adopting these changes. Therefore, more complex tasks are associated with more learning conducive to changes in task strategies (Galbraith, 1973; Perrow, 1967).

Empirical work has supported the link between task uncertainty and more informal means of coordinating work. For example, Argote (1982) found evidence in emergency room settings that uncertainty in the task environment (reflected in the distribution of patients across different disease conditions) was associated with an increased use of non-programmed means of coordination, such as on-the-spot problem solving and knowledge sharing. In new product development teams, Hansen, Podolny, & Pfeffer (2001) found evidence that uncertain tasks required more exploration activities from team members. In the creativity literature, increased job complexity was found to facilitate employee generation of more novel ideas in their work (Oldham & Cummings, 1996).

In sum, task complexity should facilitate job crafting on the task, relational, and cognitive components. Complex tasks require more adjustments in the task strategies, by shaping the way individuals perform their tasks. Individuals who work on a complex task will learn about the task while they work, and thus they will make more use of in-process planning (Wittenbaum, Vaughan, & Stasser, 1998). Since complex tasks require more exploration activities, individuals will be likely to interact more

with others to learn different task strategies and access novel knowledge that may be located with others in the organization. Finally, complex tasks are more likely to facilitate individuals' sense of significance and meaningfulness in their work by increasing their intrinsic motivation (Hackman & Oldham, 1976). Therefore, I propose the following:

> ***Proposition P2:*** *Task complexity will be associated with higher levels of job crafting behaviors.*

Task Interdependence. The level of task interdependence with others, on the other hand, decreases one's sense of control over work, thus it should negatively influence individual job crafting behaviors. Theoretical work on job crafting has suggested that interdependence actually decreases one's perceived opportunities to craft his or her job (Wrzesniewski & Dutton, 2001). These researchers argued that job features such as the level of monitoring and task interdependence should negatively affect the extent to which individuals craft their jobs. This is because people who work under increased interdependence have more constraints and less freedom to alter tasks and relationships as a result.

In any kind of organizational setting, there is some degree of interdependence built into work, such that individuals do not carry out their tasks in complete isolation from the work of others. Task interdependence has been defined as "the extent to which the items or elements upon which work is performed or the work processes themselves are interrelated so that changes in the state of one element affect the state of others" (Scott, 1987: p. 214). Thus, in organizations individuals will need to time their actions in relation to others' actions, and coordinate their task behaviors with those of others in their work group (Thompson, 1967). Further, workflow interdependence is associated with more use of personal and group coordination modes (Van de Ven, Delbeck, & Koenig, 1976), where individuals and groups need to adjust their behaviors to the behaviors of others in the organization. Therefore, task interdependence with others at work should constrain individual task crafting, because individual work routines need to take into consideration the actions of others. When task interdependence is high, individuals need to communicate, exchange resources, and depend on one another to complete their work (Campion, Medsker, & Higgs, 1993; Wageman, 1995) as part of their jobs. Therefore, they will be less likely to

initiate themselves other external interactions as a form of crafting, because they will likely spend their time interacting with those with whom they are interdependent as required to complete the job. Based on the above arguments, I propose the following:

> ***Proposition P3:*** *Task interdependence with others at work will be associated with lower levels of job crafting.*

3.3.2 Work Context Influences – Relational Factors

The relational context of work can exert a strong influence on individuals, through social norms that can control individuals' behaviors even more powerfully than hierarchical control does (Asch, 1951; Barker, 1993). Further, in many work settings (such as those involving work in teams, social referents are often directly involved in the performance of one's role (Hackman, 1990). The social context of work is likely to influence people's experiences of work not only by providing cues that individuals use to make sense of their work situation (Salancik & Pfeffer, 1978), but also by directly shaping individuals' perceptions of the work climate in terms of its conduciveness to trying new things in the work processes. Moreover, boundaries present between different professional or occupational communities or groups collocated in the same organization (Dougherty, 1992; Carlile, 1997; 2002; Bechky, 2003b) can also affect the job crafting of their members.

Work Group Psychological Safety. One's work group and the leadership of the group or the organization can facilitate or impede the creation of a psychological climate that fosters experimentation and trying new things on the job. Organizational change literature (Schein & Bennis, 1965) has suggested that organizations need to create psychological safety for individuals if they want to encourage change in behaviors, because individuals will be more likely to pursue change at work if they feel psychologically secure, or unthreatened by others' evaluations of their behaviors. Supportive leadership is expected to boost intrinsic motivation, whereas controlling supervision is expected to diminish intrinsic motivation and creativity (Deci & Ryan, 1985; Deci, Connell, & Ryan, 1989). Further, a work group climate that is supportive of experimentation and new approaches to work should be critical for individuals to engage in

job crafting behaviors, because it serves to ensure that group members feel comfortable in taking risks and trying new things (Anderson & West, 1998; Gilson & Shalley, 2004). Group climates that foster participative safety, where individuals' involvement is motivated and reinforced while it is perceived as interpersonally non-threatening, have been hypothesized to lead to increased team innovation (West, 1990).

There is growing evidence that factors related to the climate of a group can foster change, learning, and creativity behaviors of groups and among group members. For example, in the creativity literature, there is evidence that organizational climate for creativity – conceptualized as individual perceptions of organizational, supervisory encouragement, work group support, freedom, resources and challenge – determines the extent of creativity in organizational work environments (Amabile et al., 1996). In the innovation literature, Scott and Bruce (1994) found that the perceived climate for innovation – conceptualized as individual perceptions of a work climate that supports and offers resources for innovation (provided by both the work group and the leadership) – in a research and development facility predicted individual innovative behaviors for scientists, engineers, and technicians. In another study, group climates that provided support for creativity and risk taking and tolerance for mistakes were found to be associated with increased team innovation (Caldwell & O'Reilly, 2003). And in the group learning literature, researchers have found empirical evidence that a team's psychological safety – conceptualized as a shared belief of team members that their team is safe for interpersonal risk taking – facilitated team learning behaviors in work teams in a manufacturing setting (Edmondson, 1999), which in turn led to increased team performance. Similar insights and empirical findings were provided for medical settings, where learning a new technology was facilitated by psychological safety (Edmondson, Bohmer, & Pisano, 2001). In management teams, a group climate emphasizing learning rather than performance goals was found to encourage adaptive behaviors (Bunderson & Sutcliffe, 2003).

A work climate characterized by supportive supervision was also found to be associated with higher supervisor rated creativity in work (Oldham & Cummings, 1996). Gilson and Shalley (2004) found that teams engaged in more creative processes when their members perceived their work environment as

interpersonally non-threatening and where there was tolerance and even encouragement for taking risks and trying new approaches. In a comprehensive review of the relevant research on contextual effects on creativity, Shalley, Zhou, and Oldham (2004) concluded that supportive supervisors facilitated individual creativity at work (see also Amabile & Conti, 1999; Amabile et al., 1996; Amabile & Gryskiewicz, 1989).

Further, organizational improvisation scholars have argued that good improvisation occurs in an environment that is receptive to people taking risks, perhaps looking silly, and possibly making errors (Crossan & Sorrenti, 1997). In contrast, environments that promote "blocking" or the systematic discouragement of one's ideas in a group typically involve evaluative judgments of individual actions, which are counterproductive to improvisation. The basic argument of the organizational improvisation researchers is that improvisational climates (named also experimental cultures; Cunha, Cunha, & Kamoche, 1999; Vera & Crossan, 2004), by pursuing exploration activities and tolerance for "competent mistakes" (that result from novel ideas rather than flawed execution), promote action as opposed to reflection as a way to understand and deal with reality (Cunha, Cunha, & Kamoche , 1999). In sum, theoretical work and existent empirical evidence support the idea that a work climate that supports experimentation facilitates individual learning, creativity, and innovation at work.

In the case of job crafting, the work climate should also play a significant role in the extent to which individuals engage in shaping their jobs. In contrast to innovation and learning though, job crafting is not necessarily learning-oriented, since individuals may decide to shape their tasks and relationships for reasons such as creating a better fit with their interests (e.g., doing work in ways that make it more interesting for the individual), skills (e.g., adopting routines that make the most use of an individual's specific abilities), or motivation (e.g., wanting to be unique or different from others; Fromkin , 1972; Snyder & Fromkin, 1980) at work. Therefore, it is not as much the goal orientation facet of the work group climate (e.g., learning orientation versus performance orientation) that should impact individual job crafting as it is the interpersonal climate supportive or not of trying new things or doing things differently at work.

A work group's climate for interpersonal risk taking and trying novel things should be a strong determinant of the actions that individuals take to craft their jobs, for the following reasons. Work groups with a shared belief that the work group is an interpersonally safe environment are more likely to encourage their members to individually try novel things on their jobs, by crafting the task boundaries of their work. When individuals perceive their social environment at work as safe for interpersonal risk taking, they know that there are interpersonal norms that create a sense of individual confidence or trust in coworkers that these will not reject, embarrass, or punish the individual who adopts different task routines. Thus, individuals who perceive a safe interpersonal environment will take more risks regarding task strategies, will interact more with others to ask questions about work procedures and feedback from others, and thus will be more willing to be vulnerable to others (Rousseau et al., 1998).

Perceptions of safe interpersonal climate at work will thus alleviate excessive concerns about how others will react to individual actions that have the potential for embarrassment or threat. Job crafting behaviors, which may encompass trying novel things on the job and altering routines, or asking others about how to complete the tasks, have the potential to embarrass or threaten individuals' sense of self-worth and image in front of coworkers, because of their unknown relationship to task effectiveness. When individuals perceive their work climate as being safe for interpersonal risk taking and experimentation, they will feel more comfortable in trying new routines in their jobs, because others will not reject them for this, but will actually encourage them to do that, and therefore they will more likely experience a sense of increased job significance. Therefore, I propose the following:

> ***Proposition P4:*** *Work group psychological safety will be associated with higher levels of its members' job crafting behaviors.*

Occupational Communities of Practice in Organizations. Occupational membership plays an important role in how work gets done in organizations (Barley & Kunda, 2006). Barley and Kunda documented important changes in the occupational structure of society and pointed out that in recent years occupational forms of organizing have become more prominent. Individuals derive an important facet of their social identities from membership in their work or occupational groups (Van Maanen &

Barley, 1986; Fine, 1996). In the modern workplace, as individuals are likely to change organizations more frequently than in the past, one's occupational association becomes more important than one's organizational association.

Membership in the same profession and proximity at work (due to membership in the same organization) make the impact of these occupational communities of practice a very important factor in shaping members' conceptions and approaches to work. I argue there are at least two main reasons why occupational communities of practice in organizations shape their members' job crafting. A first reason relates to the idea that occupational communities of practice in organizations enable members' agentic behaviors through knowledge sharing, common work goals, and interpersonal trust. A second reason relates to the idea that occupational communities of practice in organizations enable the affirmation of members' distinctiveness in relation to neighboring occupations in the same organization. I explain these two arguments in detail below.

First, I suggest that occupational communities of practice in organizations are relational and informational resources that facilitate agentic work behaviors by their members. Occupational communities of practice within organizations are characterized by a high degree of agreement among their members on work values, beliefs, and work goals, coupled with high levels of knowledge sharing and interpersonal trust among their members. These features are a result of common membership in the same professional group and the same organization. Common membership in the same professional group provides the basic work values, beliefs and principles, whereas common membership in the same organization builds on these by fostering knowledge sharing processes and interpersonal trust. I argue that the relational resources created in occupational communities of practice facilitate job crafting behaviors. These relational resources are likely to promote job crafting because individuals are more willing to take risks in relationships and explore new behaviors in a work environment of trust and psychological safety (Mayer et al., 1995; Rousseau et al., 1998; Edmondson, 1999; Caldwell & O'Reilly, 2003).

Further, the knowledge sharing processes within an occupational community of practice promote the creation of important informational resources. Such information flows can fuel agentic work behaviors and thus job crafting, because they provide a mechanism to increase task knowledge and help individuals retrieve task knowledge from others in the organization (Spreitzer et al., 2005; Moreland & Argote, 2003).

Second, I suggest that occupational communities of practice in organizations enable the affirmation of their members' distinctiveness in relation to neighboring occupations in the same organization and, as a result, they foster job crafting. Organizations often contain many different professional groups, each of them operating in a distinct community of practice. For example, hospitals are workplaces where physicians, nurses, anesthesiologists, support staff and other occupational groups work together in patient care teams, but also operate within the cognitive and social boundaries of their own occupational communities. Even in organizations employing one main occupational group (e.g., in the case of schools -- teachers), there are often subgroups or specialties (Halpern, 1992; Ferlie et al., 2005) that develop their own occupational communities of practice (e.g., regular education teachers versus special education teachers).

Generally, regardless of organizational boundaries, neighboring occupations and specialties or segments of an occupation have been competing for legitimacy and authority over their task domain (Abbott, 1988; Halpern, 1992). For example, at the beginning of the last century, physicians competed with radiological and laboratory technologists, physical therapists, and nurse anesthesiologists over what constituted their tasks until the former group established authority by excluding the others from tasks they claimed as wholly their own. Thus, occupational groups try to establish occupational jurisdiction, by setting the task boundaries over which they have the authority in deciding how to do the work.

The same dynamic operates within organizations, between different professional groups or segments of the same professional group that try to demarcate their task territory. Whereas a large part of the jurisdiction over tasks is set through public or legal claims, a significant part is taken care of in the workplace (Abbott, 1988). Since the task is the means of continued existence of an occupational group or

specialty, these groups will guard their core task domains from potential competitors (Bechky, 2003a; Allen, 2000; Mesler, 1991). I argue here that members of different occupations or specialties in an organization will want to develop and maintain their own, idiosyncratic routines and practices, as a way to establish their uniqueness from members of other specialties and foster their legitimacy in the organization.

Psychological literature indicates that threats to group distinctiveness should activate in the group concerns to increase the distance between the ingroup and the relevant outgroups (Brewer, 1991; Brewer & Picket, 1999). When distinctiveness of a group is threatened, group members are more likely to appeal to protectionism and be more sensitive to relative group status. Group members may define themselves using traits that are most distinctive to the ingroup. In particular, for occupational groups in an organization, members will use the core tasks of the group that are distinctive from the tasks of other neighboring groups, to define their identity. This is especially true for neighboring occupational groups, whose task boundaries are more ambiguous, permeable, or less explicit. This is consistent with Brewer and Picket's (1999) observation that a higher intensity of ingroup-outgroup contrasts is frequently noticed between groups that are highly similar to each other.

When members of an occupational group craft their work in unique ways that are not known by other groups, they embed in their practice their tacit, contextual, local knowledge that others do not possess. The more job crafting takes place in the work of the occupational group or specialty considered, the more tacit, complex, difficult to understand, or unclear to other occupational groups seems the knowledge embedded in the practice. Therefore, job crafting is likely to be used by members of occupational groups or specialties in an organization to establish their task domains, and thus their legitimacy and authority in the organization over members of competing or neighboring occupations.

Therefore, based on the above arguments, I propose the following:

Proposition P5: *The strength of the occupational community of practice within the organization will be associated with higher levels of its members' job crafting behaviors.*

Certainly, individual difference factors can play a role in people's decisions to engage in job crafting. In particular, scholars have suggested that job crafting may be influenced by individual motivations and work orientations (Wrzesniewski & Dutton, 2001). Skills may also play a role in the extent to which people craft their jobs. Since the focus of this research is not on motivational factors that impact job crafting, I only briefly mention some of the motivational factors that may have an effect on individual job crafting. The motivational factors mentioned here do not constitute an exhaustive list, but just some of the main individual difference factors that may impact job crafting.

As described in the previous chapter, motivation to craft one's job may originate from three individual needs: need to control one's job and work meaning, need for a positive self-image, and need for human connection (Wrzesniewski & Dutton, 2001). Further, individuals who have a higher need for uniqueness or distinctiveness from others may be more likely to craft their jobs in unique ways, to differentiate themselves from others whom they perceive they are too similar at work (Fromkin, 1972; Snyder & Fromkin, 1980). Too much similarity or excessive deindividuation provides little basis for comparative appraisal and self-definition, therefore individuals are uncomfortable in situations in which they lack distinctiveness (Fromkin, 1972). Crafting one's job in unique ways may be a way to achieve the desired level of individual distinctiveness from others.

Another individual need that may play a role in job crafting is need for cognitive closure (Kruglanski, 1989; Kruglanski & Webster, 1996). The need for cognitive closure has been defined as a desire for a definite answer to a question and an aversion toward uncertainty, confusion, or ambiguity (Kruglanski, 1989). Individuals with high need for closure will be more likely to seek immediate and permanent answers, such that they will not face the necessity to revise again in the future and the ambiguity and uncertainty of these revisions (Kruglanski & Webster, 1996). Therefore, it seems likely that individuals with higher need for cognitive closure will be less likely to craft their jobs, because crafting entails dealing with ambiguity and uncertainty over the how to carry out work.

Finally, individuals may differ in their growth need (Hackman & Oldham, 1976), or the need for personal accomplishment, learning, and for developing themselves beyond where they are. People with

high growth needs are predicted to develop high internal motivation when working on complex, challenging jobs, and therefore are more likely to engage in more opportunities for learning new things at work. One way to do that would be to try new task approaches, experiment with different proc edures, or look for opportunities to learn new things from coworkers. Therefore, people with higher growth needs are more likely to craft their jobs. Some preliminary qualitative evidence supports this idea. Professional restaurant cooks who had a desire to do more interesting work were creating "fancy dishes", by experimenting with new things in their work and improvising changes in the traditional dishes (Fine , 1996).

3.4 OUTCOMES OF JOB CRAFTING

By crafting their jobs, people have the opportunity to redraw the nature of their relationship with their work and with others at work. Individual job crafting behaviors at work alter fundamentally the ways in which knowledge is socially constructed and distributed in collective settings. By crafting their jobs i n different ways, individuals shape the nature of their tasks and relationships, but the interdependent nature of work makes individual job crafting a factor that affects collective level dynamics too. Thus, individual job crafting has potential implications for performance not only at the individual level, but also at the collective level and beyond.

Some empirical work has looked at the consequences of related behaviors, such as organizational citizenship, and found evidence that organizational citizensh ip behaviors are conducive to enhanced individual performance (MacKenzie, Podsakoff, & Fetter, 1991) and superior collective performance (Podsakoff, Ahearne, & MacKenzie, 1997). However, as discussed in the previous chapter, organizational citizenship behavior overlaps conceptually with job crafting only partially, in the sense that citizenship behaviors refer mostly to doing more on the job, while job crafting refers to doing things differently on the job. Therefore, the conclusions of these studies cannot be extrapolated to job crafting, to derive conclusions about the consequences of job crafting behaviors.

Theoretical work has suggested that people's sculpting activities to shape their organizational roles might have an impact on outcomes such as perceptions of self-efficacy, information exchange, satisfaction with the career, organizational rewards, or even withdrawal from the organization or career (Bell & Staw, 1989). Others have suggested that facets of job crafting may have positive consequences for collectives or organizations. For example, Staw and Boettger (1990) explored the antecedents of task revision in a laboratory setting and theoretically speculated that it was positively related to performance, but this link has not been empirically tested. Since task revision occurs in the context of faulty or dysfunctional tasks, it is more likely to be associated with improvements in performance. However, it is not clear what performance consequences are associated with job crafting that occurs when tasks or procedures are actually correctly specified, or are more ambiguous or not well specified.

There is scattered qualitative evidence that job crafting may be conducive to smoother workplace operation (Fletcher, 1998; Star & Strauss, 1999), because people enact their relationships at work in ways that allow them to better coordinate with others and understand others' work. Breaking routines and existing role prescriptions through courageous behavior has been shown in qualitative research to serve broader collective or organizational performance goals (Worline, Wrzesniewski, & Rafaeli, 2002). People's experimentation with "provisional selves" -- by negotiating with themselves and others what identities they craft as they assume new work roles in organizations – has been shown to lead to increased effectiveness in the new role (Ibarra, 1999). Further, qualitative work has indicated that job crafting leads to positive changes in the meaning of work and work identity (Fine, 1996; Wrzesniewski & Dutton, 2001).

It has been suggested that job crafting is not inherently good or bad for organizations (Wrzesniewski & Dutton, 2001). Since job crafting is one way through which individuals alter the meaning of their work and potentially can change their work identity, these new meanings may impact one's subsequent motivation at work. If the new, crafted work meanings and identities actually enhance people's motivations by engaging people in behaviors that are more aligned with work group or organizational objectives, then job crafting could have a positive effect on organizational effectiveness.

However, it may well be true that job crafting can harm organizational effectiveness, when it induces behaviors that are at odds with organizational goals. Similarly, the organizational improvisation literature has suggested that trying novel ways to perform tasks can help organizations to solve problems or can escalate problems.

3.4.1 Effects of Job Crafting on Job Satisfaction and Organizational Commitment

One of the key aspects of job crafting that differentiates the construct from related ones is the fact that job crafting encompasses not only the physical task boundaries and the relational boundaries of work, but also the cognitive meanings of the tasks and work more generally. The process of job crafting has deeper consequences for the individual than, for instance, task revision or organizational citizenship behavior, because it may change one's conception of his or her work. Job crafting changes the meaning of work by altering tasks and relationships at work in ways that allow people to reframe the purpose of their job in broader terms (Wrzesniewski & Dutton, 2001). Individuals who engage in job crafting are likely to alter their jobs in ways that increase the purposefulness of what they do at work. This in turn will increase their level of job satisfaction. First, individuals who craft their jobs more will feel more committed to their own task strategies and the decisions they make in their work. When individuals are more committed to what they do in their work, they are likely to experience increased levels of job satisfaction. Second, individuals who perceive they have more control are likely to experience their work differently and see how their work relates in meaningful ways to the work of others in the organization. Any actions taken to craft their jobs, such as alterations in tasks, or enacted patterns of relationships in ways that increase purposefulness at work, are likely to increase individuals' job satisfaction.

Individuals are motivated by a desire to develop and maintain a favorable self-image (Tajfel, 1981). Therefore, individuals are likely to attempt changes in work meaningfulness as a result of their motivation to construct positive identities, via increasing the sense of purpose at work. Increased meaningfulness in work results when people feel worthwhile and valuable at work (Hackman & Oldham, 1976). Ashforth and Kreiner (1999) provide a rich description and analysis of how members of low status

occupations, whose work is devalued by outsiders, engage in cognitive processes of reframing, recalibrating and refocusing of their jobs in ways that enhance their occupational or work group identity, via the transformation of work meaning. Similarly, restaurant cooks engage in cognitive processes that change the image of their work roles (from food preparers to culinary artists), by using a "repertoire" of meanings that help them to make sense of who they are (Fine, 1996).

Individuals in any occupational domains may engage in job crafting processes that will change not only the significance of what they do at work, the meaningfulness they derive by doing their work, but also their work identity (Fine, 1996; Wrzesniewski & Dutton, 2001). This is because more meaningful work for individuals will satisfy their need for a positive self-image and identity, and their need for challenge, achievement and self-worth. This process is similar to the process through which Pratt (1998) describes how individuals identify with their organizations when organizations satisfy certain individual needs such as affiliation, self-enhancement, and self-actualization. Drawing from identity theory, researchers have conceptualized work commitment as the relative importance of work to one's sense of self (Loscocco, 1989). When individuals perceive their work as more meaningful, work will be perceived as having increased importance for their sense of self-worth, thus enhancing their levels of identification and commitment to their work. Conversely, when people do not view work as an important part of the self, it is because their work does not provide a meaningful identity of which the individual can be proud. Further, individuals who identify more strongly with their work will be more likely to experience higher levels of job satisfaction, because they will perceive their work as more attractive. As a consequence, these individuals will also perceive their organizations as more attractive, and therefore exhibit higher levels of organizational commitment. Therefore, individuals who engage in more job crafting will be more likely to identify more strongly with their work, be more satisfied with their jobs, and more attached to their organizations.

> ***Proposition P6:*** *Job crafting will be associated with higher levels of job satisfaction and organizational commitment.*

3.4.2 Effects of Job Crafting on Effectiveness

Individuals who are more engaged in their work through job crafting are more likely to achieve superior performance because of a two sets of factors - motivational and cognitive (see research on participation, Locke & Schweiger, 1979; Wagner et al., 1997). First, task crafting should exert increased motivational effects on individuals, by increasing their commitment to the decisions they make at work, the probl ems they solve, and the goals they set in their work. Cognitive crafting should also increase people's commitment to their work, with positive consequences for job effectiveness. Second, individuals who craft their tasks more are more likely to develop a deeper understanding of their work, of the interconnections among different task sequences, and of the causal mechanisms that relate task performance processes to effectiveness. Trying new ways of performing one's tasks maximizes the range of possible responses to unpredictable and complex problems. Individuals who usually craft their tasks more will likely be better equipped with novel task strategies and ideas to address the variable and complex requirements present in the work. This is because in their crafting they might have come across new routines or task sequences that can address novel task situations in superior ways. In contrast, individuals who craft their jobs less will be more likely to engage in the same routines or tasks strategies or become trapped in "habitual routines" (Gersick & Hackman, 1990), that might not be effective in the novel situations. Thus, employees who are closer to their work through job crafting are more knowledgeable about their work and better able to make higher quality decisions in their work.

The relational aspect of job crafting is also likely to have effectiveness implications. Individuals' interactions with their colleagues are helpful in achieving superior job outcomes. This is because interpersonal interactions help in the sharing of rich, contextual, situated knowledge in organizations (Orr, 1990; Bechky, 1999; 2003b). For instance, when copy machine technicians share stories about their previous experiences in solving difficult problems with copy machine failures, their communication contributes to both a technician's reputation and the efficient work of other technicians (Orr, 1990). In cases where technicians do not have a solution to the problem, simply sharing their prior experiences

through telling stories helps them with cues about potential solutions. Thus, technicians' job performance is not as much a question of being the expert in solving a particular problem, but a question of putting together different cues as pieces of a puzzle through the sharing of prior work experiences with their colleagues. Therefore, putting together the different cues from the collective memory of the technicians' community of practice helps technicians to solve problems and achieve superior performance.

Individuals in organizations develop their own idiosyncratic ways of doing work, and embeddedness in certain work or occupational groups strengthens the unique aspects of approaching tasks, communicating with others, and using technology differently (Argote, 1999). Research on situated cognition suggests that knowledge is situated and highly dependent on particular contexts and situations (Hutchins, 1991; Lave, 1991), and workers learn through interacting with their teammates and the machines they use (Brown & Duguid, 1991). When individuals have increased discretion in deciding how to accomplish their work and what task strategies to use, differences across individuals in routines and practices are likely to be accentuated (Argote, 1999). Differences in routines and practices are further accentuated by complex tasks, which are likely to lead to more job crafting (as suggested previously in this chapter). Thus, knowledge may become highly contextualized and embedded in local understandings and work practices (Dougherty, 1992; Carlile, 2002; Bechky, 2003b), and therefore "stickier" (Von Hippel, 1994; Szulanski, 1996) and more difficult to transfer between individuals.

When individuals develop ties that cut across relevant knowledge boundaries (e.g., interacting with others who have different task knowledge, such as people in other work groups or other occupational groups), they are more likely to overcome the problem of localization of superior routines. Crafting the relational boundaries of work by interacting more frequently with others provide individuals with novel sources of task knowledge or cues that they can use to craft better task strategies.

This idea is supported by prior research on boundary management in work groups, which has generally indicated that increased interactions with actors outside the group increases the information-processing capacity of the focal actor and thus, to match the task requirements (Gladstein, 1984). Further, when individual interactions with people in other work groups with task-relevant knowledge are more

frequent, it is more likely that novel or complex task knowledge will be transferred, because frequent ties tend to be stronger and thus facilitate complex knowledge transfer (Hansen, 1999). In this way, superior work routines crafted by different individuals situated in other places in the organization are more likely to be adopted by the job crafter that maintains ties with these other people. Based on the above arguments, I propose the following:

Proposition P7: *Job crafting will be associated with increased job effectiveness.*

4.0 JOB CRAFTING IN CONTEXT – STUDY 1

This chapter describes job crafting in context, by outlining the first research setting in which this dissertation is conducted, the specific hypotheses and the research methods used to test these hypotheses. I describe the operationalization of the constructs explored in the study. I also discuss the results of the factor analyses and report the scale reliabilities of the multiple-item scales used in both studies.

By its nature, job crafting is dependent on the nature of work and therefore it is a concept grounded within particular work contexts. In this dissertation, I examine job crafting in two different settings, which explore different factors affecting job crafting in organizations. This chapter introduces the first setting, which serves as an exploratory context in which individual job crafting is examined in a highly autonomous team work context, in a manufacturing organization. Thus, contextual aspects relevant to team work are considered in the exploration of job crafting.

Chapter VI introduces the second research setting for this dissertation. Given the important influence of work contexts in shaping organizational behavior (Rousseau & Fried, 2001; Cappelli & Sherer, 1991; Johns, 2001, 2006), and their particular relevance for job crafting, in the second setting I conducted more extensive qualitative work to understand in more depth job crafting. The second setting provides a richer understanding of job crafting behaviors of individuals and how they craft their work, by exploring two important contextual aspects – organizational factors and occupational group boundaries – and their influence on job crafting.

4.1 RATIONALE FOR EMPIRICAL CONTEXTS

The research design involved a first study that preliminarily explored job crafting, and a more extensive study that examined job crafting in more detail. The settings selected cover two different contexts that provide complementary perspectives on job crafting – a manufacturing organization in the auto industry utilizing craft-like work and autonomous teams of assembly workers; and several service organizations (schools) utilizing professional work of special education teachers (Table 4). Work experiences in the two settings share similarities but also differ in important aspects. Both similarities and differences will enable me to draw generalizable inferences about job crafting in organizations. Similarities are valuable because they enable to draw parallels between the crafting that takes place in the two occupations and types of work. Differences are valuable because they enable generalizing inferences about the present occupations to other types of work.

Table 4 Similarities and Differencs between the Two Studies

Issues	***Study 1: Manufacturing Work***	***Study 2: Service Work***
Opportunities for crafting	High (autonomous work)	High (professional work)
Importance of skills	High (broad sets of skills)	High (general and special education knowledge)
Proximity with beneficiaries of work	Low	High
Impact on beneficiaries	Indirect, less visible	Direct, more visible
Proximal work context	Work group	Occupational subgroup
Opportunity to study broader organizational context	NA	Yes
Levels	Multiple teams	Multiple organizations

In terms of similarities, both craft work in autonomous teams and professional work in school settings provide individuals significant discretion in work, and thus enhanced opportunities to observe crafting (Wrzesniewski & Dutton, 2001). Further, in both cases, employees draw upon a broad range of skills to do their work – manufacturing workers in the setting selected had broad sets of skills utilized to perform various tasks in their teams (e.g., being able to perform all tasks for assembling half of the vehicle); special education teachers draw upon regular and special education knowledge to do their work. These elements make the individual and her job crafting behaviors a more salient and critical element for performance.

Regarding differences, the two occupations differ in terms of education requirements, status, degree of proximity and contact with the beneficiaries of work, and impact on the beneficiaries of work. Teachers are required to attend college and even graduate studies (e.g., Masters in special education); manufacturing workers perform their work with substantially less education. Teaching work is considered higher status than assembly work in manufacturing. Further, teachers – as many service workers – work in high proximity with their beneficiaries (e.g., students) and have frequent contact with them, compared to manufacturing workers. Finally, teachers' work has a more direct, visible impact on the beneficiaries of work than assemblers' work.

In addition, the two settings help answer complementary questions regarding the antecedents of job crafting. Work in team-based manufacturing affords a better understanding of team-level influences on job crafting. The work of teachers affords a better understanding of occupational group influences, as well as organizational level influences on job crafting, since several organizations were included in the study.

4.2 STUDY 1 - CRAFT WORK IN MANUFACTURING

4.2.1 Work Context

The first research setting is a unique setting for manufacturing work, that has been labeled by some observers "neocraft" (Berggren, 1994) – Volvo's Uddevalla plant. Volvo has been viewed as the prototype of modern craft work, centering its efforts on the redesign of work and work organization in an effort to enhance worker satisfaction and involvement, and increase the professionalization of workers (Berggren, 1992; Ellegard et. al., 1991; Sandberg, 1995). Uddevalla has been the subject of extensive research on the effects of innovative work designs on workers outcomes (see Sandberg, 1995) and of extensive debates on the relative benefits of this design model as compared to others (i.e., lean production) in terms of cognitive and efficiency outcomes, for both individual workers and the organization as a whole (see Adler & Cole, 1993; 1994; Berggren, 1994). However, empirical work at Uddevalla lags the theoretical work, and an exploration of work in this setting would add value to our understanding of job crafting behaviors and their antecedents and consequences in organizations.

Three essential features make the Uddevalla context a good setting for this study: team-based work characterized by high autonomy levels, the craft nature of work resulting from low levels of following task scripts, and a high degree of professionalization of workers. Teams are a key component of the Uddevalla production system. Each team worked in a docking station, where cars remained stationary while workers carried out their tasks, with long work cycles lasting between 90 minutes and three hours, and contrasting sharply with work cycles of .8 to 2 minutes in a typical automotive assembly plant (Ellegard, 1995). The teams worked independently from each other and assembled complete cars, in a craft-like system. Teams had significant latitude in setting the work pace and in shaping the nature of work processes and tasks they performed. Thus, teams developed their own ways of doing things resulting in work routines that differed in their potential contribution to superior performance. Idiosyncratic work patterns within the teams and different levels of external communication with

individuals in other similar teams and other occupational groups might have led to further localization of work practice and high heterogeneity in performance.

Uddevalla's reliance on teamwork and its extensive emphasis on individual skill development are illustrated by company documents showing that the mission of the plant is to achieve "quality cars", "flexible production", "caring for the environment", and "inspiring job experience for empowered people"; and that "our competitive advantage is based on teamwork and dedicated skilled employees". The "inspiring job experience" is built on individuals' autonomy and opportunity to achieve enhanced levels of skills. Good completion of teams' tasks required a significant job experience. Company records showed that workers needed a minimum of 12 weeks and up to a year of on-the-job training to learn the job properly and perform tasks at the accepted speed. With prior work experience in the industry, workers needed approximately 12 weeks to achieve full performance, but workers with no prior experience needed 16 weeks or more to achieve superior performance. The training program the company offered typically lasted two weeks, providing workers with the basic knowledge about work procedures; however, this training was not sufficient to ensure high performance levels. Thus, most workers learned to do their jobs in the team setting, during the work process. Given the long work cycles and the associated variety in tasks to be performed by workers, most workers developed high levels of professionalization reflected in extensive skill development. Some team members also rotated among jobs within their teams, almost every vehicle, so that they developed multiple skills.

Absenteeism was a frequent problem for the organization in this study, as it was documented by company records, with an average monthly absenteeism level of 2.23 days (for the year when the survey was administered). For example, in one day during the first visit at the site, 15.9 % of the workers in one of the workshops visited were absent. Accordingly, there was a high degree of membership change in the teams, with significant implications for the level and nature of interaction among team members. For example, frequent membership changes in teams may be good for transactive memory at the organizational level, but not for transactive memory at the group level (Moreland & Argote, 2003), because greater personnel rotation is associated with greater social network connectivity at the

organizational level. To illustrate the effects of membership changes at Uddevalla, in one of the workshops, the area management's assessment of the effects of frequent membership changes due to absenteeism was that "quality was better and more predictable when teams were more stable". The original driving force behind the introduction of the craft-like production model was to curb absenteeism levels in the plant, in the context of the Swedish labor market characterized by highly-educated workers with relatively high standards of living. Thus, boosting workers' motivation was the trigger for the innovative work design elements introduced in assembly work. However, the discussions with managers and the records of high absenteeism indicated that workers' motivation was still a hot issue in this setting.

Critics of this model of work organization have emphasized that, although elements of the Uddevalla approach promised a higher potential for individual learning, the model was not effective in achieving high levels of organizational learning (Adler & Cole, 1993), because of the longer work cycles and non-standardized work. Uddevalla management's evaluation of the impact of the current design was that "it was very difficult to trace the origin of [production] faults", and "some areas went up and down in quality" of the assembly process. The long work cycles and the non-standardized work processes allowed workers to actively shape their work in different ways, thus "craft" their jobs by actively taking opportunities to shape the content and number of tasks, view their jobs as more or less meaningful in the broader scheme of things, and shape the pattern of interaction with others at work. Thus, one way to explore work in such a setting is to explore the various ways in which individuals shape the boundaries of their jobs, what drives this job crafting, and what its consequences are. Thus, this setting constitutes a good context for exploring the boundaries of work, how individuals craft their jobs in different ways, and the associated effects on individual outcomes.

4.2.2 Hypotheses

Given the context described in the previous section and following the propositions outlined in Chapter 3, I propose the following hypotheses:

Hypothesis H1: *Employee discretion over work processes will be associated with higher levels of individual job crafting behaviors.*

Hypothesis H2: *Task complexity will be associated with higher levels of individual job crafting behaviors.*

Hypothesis H3: *Work group task interdependence will be associated with lower levels of individual job crafting behaviors.*

Hypothesis H4: *Work group psychological safety will be associated with higher levels of individual job crafting behaviors.*

Hypothesis H6: *Employees who engage in more job crafting will report higher levels of job satisfaction and organizational commitment, and exhibit lower levels of absenteeism*

Hypothesis H7: *Employees who engage in more job crafting will have increased job effectiveness.*

4.3 STUDY DESIGN

The first study is an exploration of job crafting using data I collected together with Frits Pil and Carrie Leana in a larger field study designed to examine the effects of changes in production models from a craft-like work system to a line-oriented production model of work. The current study is an analysis aimed at understanding the facets of job crafting, and its antecedents and consequences, in autonomous teams. Therefore, the design for this research is a field study in which surveys are utilized to gather data on employee attitudes and behaviors. I also conducted exploratory qualitative work to develop a more accurate understanding of the nature of work in this setting. I supplement the surveys with archival data on performance and absenteeism levels.

4.3.1 Procedures

In a first visit to the plant in the summer of 2001, I conducted exploratory qualitative research to develop an accurate understanding of the nature of work in this setting. I observed and videotaped the teams while

they were working, looking specifically at how workers in various teams enacted their jobs in different ways, interacted with each other, and coordinated their work. I collected field notes based on my observation of the individuals working and on discussions and interviews with various parties involved, such as workers, supervisors, plant manager, human resources manager, and various union representatives such as safety representatives, representatives from the academic engineers' union, low level management union, and white collars' union. Based on the observations and interviews conducted in the first visit, the survey instrument was developed, which was designed to tap into both individual and team level processes in craft work. In a second visit to the plant in the fall of 2001, the surveys were administered to all production workers. Due to the small sample size available in this setting, all production workers were targeted for participation. Participants were instructed to return the survey directly to the researcher, in closed envelopes. For the absentees, participants were left a copy of the survey with instructions to return the survey by mail. The surveys were completed on site and on company time, after the employees' work shift. 164 workers returned completed surveys, representing a response rate of 89%. The survey responses were matched to supervisor ratings of employees' output (both efficiency and quality), as well as archival records on absenteeism.

I constructed the team membership data from product build data sheets provided by management for a period of two weeks, which tracked people who worked together on the same vehicle in each workshop. The company did not keep track of team membership in any other way. Although one goal was to maintain stable team membership, on any given day there would be absentees and consequently people filling in positions in other teams to cover for the absentees. Thus, one problem encountered when analyzing the product build data sheets was that the teams had a fairly high level of membership fluctuation. A significant percentage of workers included in the survey worked in a completely different team from one day to another, so I could not find a relatively stable team configuration of which the worker was a part. Thus, I obtained team membership information for 70 employees in 21 stable teams. The average team size was 3.43 members (with around 3 or 4 members per team, and a standard deviation of SD=.59). I draw on this subset of the sample for analyses requiring team-level data.

4.3.2 Measures

Most of the instruments used in this study were based on measures developed and used in previous studies of work design, work group characteristics, and group learning. In the absence of validated scales, new measures were created. In cases where there were multi-item indices, I created each index by averaging the ratings over the items that comprised that measure. Factor analysis and scale reliability analyses are presented in the next sections of this chapter. The items used in the survey are indicated in Appendix A, together with the source of each scale.

Discretion. To measure discretion in work, I followed previous research indicating that discretion and control over work are important to the extent that they are *perceived* by the actor (Ganster & Fusilier, 1989; Ashforth & Saks, 2000). Perceptions of personal control over work were measured with a scale consisting of six items, which was adapted from Jehn's (1995) task type scale (5-point scale with anchors 1="strongly disagree" and 5="strongly agree"). In this study, the scale was shortened and adapted to capture the extent to which employees perceive they have freedom over the work processes they perform.

Task complexity captures individuals' perceptions of the extent to which the tasks they perform incorporate uncertainty in the ways they should be performed and variability of the content of the task. The measure used in this study was adapted from Hackman and Oldham's (1975) job characteristics scale, by using the job uncertainty and variety components (six items). The response format used was based on a 7-point Likert-type scale for four of the items (scale anchors 1="very inaccurate" and 7="very accurate"), and a variation of this format for the other two items (scale anchors 1="very little" and 7="very much"; see Appendix A).

Job crafting. The measure of job crafting used in this study captures the three facets of job crafting, as discussed in Chapter 3: shaping the task boundaries of work, shaping the cognitive task boundaries, and shaping the relationships one establishes to carry out his or her work.

Task crafting was measured using supervisor ratings of employee task initiative on the job (on a one to five scale, with the anchors 1="poor" and 5="outstanding"). Supervisors rated each employee on

the level of task initiative they took during the car assembly task processes. Employees with higher levels of job crafting were those rated by their immediate supervisor as taking more initiative in shaping the tasks they performed.

Cognitive crafting. Following Wrzesniewski & Dutton's (2001) suggestions, I also explored the cognitive crafting individuals do in their work. Cognitive crafting captures the extent to which individuals ascribed increased significance and meaning to their jobs. Wrzesniewski & Dutton described this as a form of job crafting. Task significance was measured using Hackman and Oldham's (1975) three-item job significance scale. The response format used was based on a 7-point Likert-type scale for two items (scale anchors 1="very inaccurate" and 7="very accurate") and on a variation of this format for the third item (scale anchors 1="not at all significant: the outcomes of the work are not likely to affect anyone in any important way" and 7="highly significant; the outcomes of the work can affect other people in very important ways").

Relational crafting was measured with four items that capture the frequency of interaction with different employee groups at work (not part of the formal job duties), in the month prior to survey administration. Each of the 4 items captures a specific employee group with whom an individual worker might interact during work to accomplish his or her tasks (e.g., members of teams in the same production area, engineering employees, material handling employees, and maintenance employees). Thus, the measure captures two aspects of interpersonal relationships at work that can be shaped by individuals: with whom one interacts (each employee group constituting a potential source of specific knowledge), and the amount of interaction with each relevant employee group. The response format for this portion of the survey was on a 1-to-7 scale, with anchors 1="never", 2="once a month", 3="a few times a month", 4="once a week", 5="a few times a week", 6="once a day", and 7=multiple times per day". The measure was created as an index of two components: (1) relational range and (2) relational strength, which are both described in detail later in this chapter.

Team variables. Work group task interdependence. The extent to which group members perceived they are interdependent with others in their team was measured using Campion, Medsker, and

Higgs's (1993) three-item measure of task interdependence. The response format used was based on a 5-point Likert-type scale (with anchors 1="strongly disagree" and 5="strongly agree").

Team psychological safety was measured using Edmondson's (1999) seven-item measure. Drawing on qualitative data obtained from interviews, Edmondson argued that team psychological safety captures team members' shared beliefs that their team is safe for interpersonal risk taking, and describes a team's climate characterized by interpersonal trust and mutual respect in which people are comfortable being themselves. The response format used was based on a 5-point Likert-type scale (with anchors 1="strongly disagree" and 5="strongly agree").

Outcome measures. Job satisfaction was measured using a 5-item scale utilized by Judge, Bono, and Locke (2000) and originally developed by Brayfield and Rothe (1951). The scale measures global job satisfaction by asking general questions regarding an individual's feeling regarding his or her job. The responses were measured using a 5-point Likert-type scale with the anchors 1="strongly disagree" and 5="strongly agree". An index was created by averaging the ratings across the five items.

Organizational commitment was measured with the 8-item affective commitment scale developed by Meyer and Allen (1997). The responses were measured using a 5-point Likert-type scale with the anchors 1="strongly disagree" and 5="strongly agree"

The level of *job effectiveness* was measured using supervisor ratings of employees' task efficiency and task quality, rated on a one to five scale (anchors 1="poor" and 5="outstanding"). These assessments were done by supervisors after the surveys were collected. An index was created by averaging the two measures of effectiveness. I also obtained archival data on daily *absenteeism* levels for each individual. I further created a measure of health-related absenteeism for a two-month period after the survey was conducted, which is described in more detail later in this chapter.

Control variables. In addition to the above measures, I also collected demographic data that might potentially be systematically related to the dependent variables of interest in the study. Thus, I collected information on employee age, gender, experience, and skills, to include as control variables. Employee experience was measured as time spent in the current job. Employee skills were measured

using archival data on employee skills sets. The archival data were based on supervisor evaluations of each employee on a variety of skills related to different aspects of the assembly work, including skills needed in other areas of assembly than the area where the employee was currently working. However, skills were independent of the supervisor ratings of performance, representing a historical model of skill development in the assembly process. The skill measure used here was an overall aggregate of all the skills found in the archival data mentioned above.

4.3.3 Factor Analysis Results

Because discretion, task complexity and cognitive crafting were self-reported measures, a principal component analysis was conducted on the scale items to determine whether the measures were empirically distinct. Factor loadings from a three-factor solution performed using principal component analysis with varimax rotation are presented in Table 5. The criterion used for retaining a factor was that the correspondent Eigenvalue exceeded the value of 1.

Previous literature suggested a threshold level for the factor loadings of 0.40 (Gorsuch, 1983). Examination of the factor loadings revealed that items for the three scales generally loaded on three distinct factors, with two exceptions. First, for the discretion scale, the last three items did not load above the 0.40 threshold on any of the three factors. The fourth item captures a slightly different facet of discretion in the work process than the remaining items – the freedom to deviate from the *sequence* of task steps that an individual performs. This may explain why this item did not load above 0.40 on the factor (factor 1) on which the first three items loaded. Because of the low loading on factor one (loading=0.390), this item was dropped from the analysis. Further, the fifth and sixth items were worded negatively and this may have influenced individuals' answers to these questions and therefore the resulting loadings. This finding suggests that these last two items of the discretion scale should be dropped from the analysis. Therefore, items 5 and 6 of the discretion scale were also dropped. After the principal component analysis, the resulting discretion scale had three items (items 1, 2, and 3).

Second, two items of the task complexity scale loaded over the threshold of 0.40 on other two factors. Item 8 captures the extent to which the tasks performed required a trial-and-error approach - process that is associated with increased levels of uncertainty in the task, a facet of task complexity. This item cross-loaded on two factors, with very close coefficients (0.420 on factor 2 and 0.413 on factor 3). Therefore, this item was dropped from the analysis. Item 9 loaded on factor 1, along with the first three items from the discretion scale. This may be explained by the wording of the item. The item captures the degree to which workers had to try different things on the job to come up with the best approach - a facet of task uncertainty. One possibility is that some participants may have interpreted the wording "have to try […] different things on the job" as an aspect of the freedom to try different things on the job (discretion) rather than as the necessity to approach the job in different ways ("have to try") due to its complex tasks. Therefore, this item was dropped from the analysis. After the principal component analysis, the resulting tack complexity scale had four items (items 7, 10, 11, and 12).

Finally, all three items of the cognitive crafting scale loaded over the 0.40 threshold, as expected, on a third distinct factor, with no cross-loadings on other factors. Thus, all three items of the cognitive crafting scale were kept in the analyses. Taken together, the results of the principal component analysis provide some encouraging assurance that, with the possibility of dropping a few items from the first two scales, the self-report measures used in the present study are empirically distinct constructs.

Table 5 Principal Component Analysis – Discretion, Task Complexity, and Cognitive Crafting

Item		***Orthogonal rotation (Varimax-rotated factor loadings)***			***Decision***
		F1	***F2***	***F3***	
Discretion	1. I have a lot of autonomy in solving production-related problems	**0.693**	0.221	0.072	***retained***
	2. I have freedom to explore new ways to improve the vehicle building process	**0.807**	0.217	-0.017	***retained***
	3. I am able to experiment with new techniques or tools in assembling the vehicle	**0.694**	0.215	-0.128	***retained***
	4. I determine the sequence in which I assemble my components on the vehicle	0.390	-0.222	-0.040	*dropped*
	5. I am not able to deviate from a set process as I perform my assembly tasks (R)	0.288	-0.174	-0.119	*dropped*
	6. There is a specific "right way" to do things in my job (R)	0.034	0.048	-0.385	*dropped*
Task complexity	7. How much uncertainty is there in the way you go about doing your job? That is, to what extent are you unable to predict if a particular procedure or technique is going to work or not?	0.003	**0.465**	-0.205	***retained***
	8. Much of the work on this job requires a "trial and error" approach	0.144	**0.420**	**0.413**	*dropped*
	9. I often have to try a lot of different things on this job before I can figure out what works best	**0.548**	0.395	0.253	*dropped*
	10. How much variety is there in your job? That is, to what extent does the job require you to do many different things at work, using a variety of your skills and talents?	0.364	**0.556**	0.168	***retained***
	11. The job requires me to use a number of complex or high level skills	0.060	**0.775**	0.038	***retained***
	12. The job is quite simple and repetitive (R)	0.064	**0.778**	-0.096	***retained***
Cognitive crafting	13. In general, how significant or important is your job? That is, are the results of your work likely to significantly affect the lives or well-being of other people?	-0.120	0.081	**0.767**	***retained***
	14. This job is one where a lot of other people can be affected by how well the work gets done	-0.182	0.170	**0.664**	***retained***
	15. The job itself is not very significant or important in the broader scheme of things (R)	0.201	-0.064	**0.640**	***retained***
Eigenvalue (Unrotated solution)		3.355	2.009	1.316	
Percentage of variance explained		15.98%	15.61%	12.93%	

4.3.4 Scale Reliability Analyses

The scale reliabilities for the measures used in the present study are presented in Table 6. The Cronbach's alphas of three of the scales utilized were above or equal to the 0.70 threshold recommended by Nunnally (1978). The coefficient alpha for the task complexity scale was 0.70 and for the job satisfaction scale was 0.87. For the discretion scale, after dropping the last three items in the principal component analysis, the resulting reliability coefficient was 0.76. For the organizational commitment scale, the reliability analysis suggested that dropping the fourth item would increase alpha from 0.66 to 0.76. Therefore the fourth item was dropped and the remaining commitment scale had 7 items. The remaining three scales (task interdependence, team psychological safety, and cognitive crafting) had Cronbach's alphas close to the 0.70 threshold. Further, for task interdependence and cognitive crafting, additional analyses to improve reliability by deleting items would have reduced the scales to two items each, with a low increase in alpha, which was still under the 0.70 threshold. For team psychological safety, additional analyses indicated that the scale reliability would not be improved by deleting items. Therefore, modifications were made only to the discretion scale. For each scale used, the final scores were created by averaging the items retained after the principal component analysis and scale reliability analyses.

Table 6 Summary Results of Scale Reliability Analyses

Scale	*Number of Items*	*Reliability Estimate (Cronbach's alpha)*
Individual level variables[a]		
Discretion	3	.76
Task complexity	4	.70
Cognitive crafting	3	.61
Job satisfaction	5	.87
Organizational commitment	7	.76
Team level variables[b]		
Task interdependence in the team	3	.63
Team psychological safety	7	.65

[a] N=164; [b] N=21

4.3.5 Computation of Additional Variables

Two of the variables in the study were computed from several empirical or archival measures. First, the measure intended to capture relational crafting was created as an index of two components: (1) relational range and (2) relational strength. I followed the method described by Smith, Collins, and Clark (2005) and Burt and Minor (1983), who created a measure of network range that captures the breath of knowledge mobilized through an individual's interactions with others. Thus, range was defined as the proportion of categories of relevant others in an individual's network to whom the individual had at least one link. Given that the range items measured whether an individual had interactions with each of four relevant categories of others (members of teams in the same production area, engineering employees, material handling employees, and maintenance employees), the range measure was calculated as the percentage of groups with whom a worker interacted out of the total number of four possible groups with whom a worker could interact. The range variable takes values between 0 (no interaction with others) and 1 (interactions with each of the four groups). Following Smith and colleagues (2005), I created the

measure of relational strength by calculating the mean frequency of interaction across all categories with whom a worker interacted in the month prior to survey administration. The frequency of interaction measures were on a 1-to-7 scale, ranging from 1 (never) to 7 (multiple times per day). Thus, the relational strength variable takes values between 1 (never interacting with the other groups in the month prior to survey administration) and 7 (interacting multiple times per day with these groups in the month prior to survey administration). The values of range and strength of interaction were significantly and positively correlated ($r=.76$, $p<.01$), thus justifying the creation of a global relational crafting measure. I created a global index of relational crafting by adding the standardized values of the range and strength variables:

Relational Crafting Index = *Standardized Value* (Range) + *Standardized Value* (Strength).

Second, the absenteeism measure was calculated, following recommendations from the literature, as the logarithm of the number of days absent by an individual in a defined period of time. The period of time selected was the two-month period after the survey administration, given that absenteeism was an outcome variable and therefore the time frame would suggest a causal relationship between the job crafting variables and absenteeism. I excluded long-term absenteeism and maternity leave from the absenteeism measure, because these types of absences were expected to be related to other external factors and not to how work is carried out on a daily basis. To reduce the skewness of the absenteeism data, I applied a log transformation to the data:

Log-Absenteeism = log (1 + Absenteeism).

This transformation reduced the skewness coefficient of the data from 2.934 (representing a highly skewed distribution; s.e.=0.186) to 0.772 (representing a moderate, acceptable distribution; s.e.=0.186). Because the original absenteeism variable (Absenteeism) took values equal to or larger than 0 (where 0 means no absences in the two-month period following survey administration), the Log-Absenteeism variable created using the formula above took values equal to or larger than log (1+0) = 0 (where 0 has the same significance as above).

5.0 RESULTS OF STUDY 1

This chapter presents the results of the statistical analyses for Study 1 of the dissertation. I begin with an analysis of the aggregation of the team-level measures used in this study. I follow this analysis with a report of the summary statistics and the zero-order correlations of the variables of interest in the study. Next, I review and summarize the results of the multiple regressions analyses and hierarchical linear modeling analyses conducted to test the hypotheses. Finally, additional analyses performed to test the effects of individual job crafting on team outcomes, and potential moderating effects on the impact of job crafting on outcomes are summarized.

5.1 AGGREGATION OF INDIVIDUAL LEVEL MEASURES AT TEAM LEVEL

Although conceptualized at the team-level of analysis, both task interdependence in the team and team psychological safety were measured at the individual level, by asking team members to report on their perceptions about their team. In order to test the effect of the two team variables on job crafting, I first assessed whether the aggregation of individual perceptions of task interdependence in the team and team psychological safety at the team level can be justified empirically.

George and James (1993) argued that the key statistical test of the appropriateness of aggregation to the group level of analysis is the existence of within-group agreement on the variable in question. If there is agreement within groups on the theorized group-level variable, then the aggregate may be used in subsequent analyses (Schneider & Bowen, 1985). Since the groups were part of the same organization, large differences among groups may not be expected because of restriction of range (James, 1982). James argued that ANOVA-based statistics that rely on a between-group comparison versus within-group

comparison (e.g., the intraclass correlation coefficient) may substantially underestimate agreement within groups when there is restriction of range across groups on the phenomenon of study. Following these recommendations, I used the procedure proposed by James, Demaree, and Wolf (1984, 1993) to calculate the interrater agreement (r_{wg}) for each team. The procedure compares the variability of a given variable within a specific team to an expected variance. I used a uniform distribution to calculate the expected error variance, since it is common practice to do that when no systematic bias in responses is expected. The median r_{wg} value for task interdependence (.67) was close to the recommended threshold level of .70, and the median r_{wg} value for team psychological safety (.78) was above this threshold. Therefore, I concluded that aggregation is justified empirically, since there was sufficient within-group agreement on the variables explored.

5.2 SUMMARY STATISTICS AND CORRELATIONS

Table 7 provides the means, standard deviations, and correlation coefficients of the variables in the study, along with scale reliability coefficients for multiple-item measures. The average age of the participants in the study was 32 years old, 35% of workers were females, and the average level of experience on the job was 4 years. Examination of the correlations between the control variables and the other variables in the study revealed that age was significantly correlated with job satisfaction ($r=.32$, $p<.01$) and organizational commitment ($r=.21$, $p<.01$), suggesting that older workers were more likely to report higher levels of job satisfaction and be more committed to their organization. Age was also significantly correlated with experience ($r=.16$, $p<.05$), suggesting that older workers tended to have longer experience on the job. Gender was not correlated with any of the other variables in the study. Preliminary analyses showed that age and gender did not have a significant effect on the variables of interest in the study. Therefore, age and gender were dropped from all the subsequent analyses.

Job experience was significantly correlated with three of the outcomes of interest in the study: quality, efficiency, and absenteeism. As expected, job experience was significantly correlated with both

facets of job performance – quality (r=.21, p<.05) and efficiency (r=.20, p<.05), and negatively correlated with absenteeism levels (r=-.18, p<.05), suggesting that more experienced workers were more likely to have higher performance on the job and be less absent from work. Finally, among the control variables, skills were significantly correlated with discretion (r=.19, p<.05) and task complexity (r=.19, p<.05), suggesting that workers who were rated by their supervisors as more skilled were more likely to report that their tasks exhibited higher levels of discretion and complexity. Skills were also significantly correlated with one of the job crafting facets – task crafting (r=.41, p<.01), suggesting that workers who were more skilled were more likely to craft their tasks. Skills were also significantly correlated with job efficiency (r=.17, p<.05), suggesting that more skilled workers were more efficient on their jobs.

Each of the independent variables (discretion, task complexity, task interdependence, and team psychological safety) was expected to be correlated with each of the job crafting components examined in the study. Discretion was significantly correlated with relational crafting (r=.30, p<.01), suggesting that workers reporting more discretion in their work were more likely to engage in more extensive relational crafting. As expected, discretion was also significantly correlated with job satisfaction (r=.26, p<.01) and organizational commitment (r=33, p<.01), suggesting that workers reporting more discretion in their work were more likely to be more satisfied with their jobs and more committed to the organization. Among the independent variables, discretion was significantly correlated with task complexity (r=.38, p<.01), with workers reporting more discretion also reporting higher complexity levels in their tasks. Despite the significant correlation, the preliminary confirmatory analyses indicated that the two constructs are distinct empirically.

Task complexity was correlated with several of the job crafting components, as predicted. Task complexity was significantly correlated with relational crafting (r=.29, p<.01), suggesting that workers reporting higher task complexity levels were more likely to engage in relational crafting. Moreover, workers reporting higher levels of task complexity were more likely to think of their jobs as more significant and meaningful, and thus exhibit more cognitive crafting (r=.19, p<.05). Finally, task complexity was also significantly correlated with job satisfaction (r=24, p<.01) and organizational

commitment (r=.20, p<.05), suggesting that workers reporting more complexity in their tasks were likely to be more satisfied with their jobs and more committed to the organization.

Contrary to predictions, task interdependence was significantly and positively correlated with cognitive crafting (r=.17, p<.05). This suggests that workers in more interdependent teams were more likely to think of their jobs as more significantly and meaningful. The hypothesized direction of this relationship (negative) was based on the argument that interdependence with others restricts individuals' freedom in how to approach their work, because they need to coordinate their tasks with those of their co-workers. This might have affected workers' perceptions of their jobs, making them to think of these as being limited in scope and significance by their dependence on others. However, it might be that workers in more interdependent teams be more likely to see their jobs as being related in significant ways to their co-workers jobs and co-workers' jobs as being dependent on their own actions. Therefore, it seems plausible that the direction of the relationship between interdependence and cognitive crafting be positive rather than negative, as initially hypothesized. Task interdependence was not significantly correlated with any other of the variables in the study.

Contrary to predictions, team psychological safety was significantly and negatively correlated with relational crafting (r=-.24, p<.01), suggesting that members of teams with higher levels of team psychological safety were less likely to engage in relational crafting. It was hypothesized that higher team psychological safety would make team members take more risks in their jobs and engage in more crafting. The correlations suggest though that team members might have been more comfortable, given the higher levels of team psychological safety, to interact among themselves, rather than go outside the team to other employee groups.

Interestingly, the three facets of job crafting were not significantly correlated with one another. This might be explained by the fact that the three facets of job crafting were measured from different sources – whereas task crafting was a supervisor assessment, cognitive and relational crafting were self-reports of individuals.

It was anticipated that the job crafting variables would be related to the outcomes of interest – job satisfaction, organizational commitment, job performance, and absenteeism levels. As expected, task crafting was significantly correlated with quality ($r=.51$, $p<.01$), efficiency ($r=.52$, $p<.01$), and negatively correlated with absenteeism levels ($r=-.21$, $p<.05$). This suggests that workers who engaged in more task crafting were more likely to have higher quality results, be more efficient in their work, and less absent from work. Relational crafting was significantly and positively correlated with organizational commitment ($r=.18$, $p<.05$), suggesting that workers who engaged in more extensive relational crafting were likely to be more committed. Cognitive crafting was significantly and positively correlated with job satisfaction ($r=.32$, $p<.01$) and organizational commitment ($r=.31$, $p<.01$), suggesting that workers who engaged in more cognitive crafting were also likely to be more satisfied with their jobs and more committed. Finally, among the outcome variables, job satisfaction was significantly correlated with commitment ($r=.72$, $p<.01$) and quality ($r=.20$, $p<.05$), with workers reporting higher job satisfaction being also more committed and rated by their supervisors as having higher quality results. Quality and efficiency were significantly correlated ($r=.85$, $p<.01$). This high correlation might be explained by the fact that both measures were supervisor ratings.

Table 7 Means, Standard Deviations, and Zero-Order Correlations

Variables	Mean	SD	1	2	3	4	5	6	7	8
1. Age	32.11	6.85								
2. Gender[a]	.35	.48	.03							
3. Experience (years)	4.14	1.79	.16*	.03						
4. Skills	1.57	.66	-.05	-.03	.14					
5. Discretion	2.26	1.00	.11	.07	-.06	.19*				
6. Task complexity	3.75	1.08	-.06	-.13	.01	.19*	.38**			
7. Task interdependence	3.28	.95	-.09	-.03	.06	-.17	-.13	.02		
8. Psychological safety	3.58	.64	.01	.01	.13	.03	-.01	.00	.13	
9. Task crafting	3.07	.71	.12	-.03	.06	.41**	.15	.15	-.16	-.07
10. Relational crafting	-.04	1.85	-.06	-.16	-.08	.16	.30**	.29**	.03	-.24**
11. Cognitive crafting	5.47	1.18	.02	.14	.08	.10	.03	.19*	.17*	.03
12. Job satisfaction	2.98	.93	.32**	-.03	.03	.06	.26**	.24**	-.01	.03
13. Organizational commitment	2.67	.47	.21**	-.10	.08	.07	.33**	.20*	.03	-.04
14. Quality	3.67	.66	.14	-.04	.21*	.16	.00	-.11	-.02	.01
15. Efficiency	3.62	.72	.06	-.12	.20*	.17*	-.03	-.16	-.00	-.02
16. Absenteeism (log days)	.41	.48	-.04	.09	-.18*	.04	.05	-.10	.06	.12

[a] Coding: 0=male, 1=female
* p≤0.05; ** p≤ 0.01

Table 7 (continued)

Variables	Mean	SD	9	10	11	12	13	14	15
1. Age	32.11	6.85							
2. Gender[a]	.35	.48							
3. Experience (years)	4.14	1.79							
4. Skills	1.57	.66							
5. Discretion	2.26	1.00							
6. Task complexity	3.75	1.08							
7. Task interdependence	3.28	.95							
8. Psychological safety	3.58	.64							
9. Task crafting	3.07	.71							
10. Relational crafting	-.04	1.85	.10						
11. Cognitive crafting	5.47	1.18	.02	-.01					
12. Job satisfaction	2.98	.93	.10	.02	.32**				
13. Organizational commitment	2.67	.47	.12	.18*	.31**	.72**			
14. Quality	3.67	.66	.51**	.04	.03	.20*	.15		
15. Efficiency	3.62	.72	.52**	.09	-.04	.13	.12	.85**	
16. Absenteeism (log days)	.41	.48	-.21*	-.08	.13	-.12	-.12	-.10	-.10

[a] Coding: 0=male, 1=female
* p≤0.05; ** p≤ 0.01

5.3 TESTS OF HYPOTHESES

5.3.1 Predictors of Job Crafting

The first set of hypotheses proposed a direct effect of each of the work context variables (discretion, task interdependence, task complexity, and team psychological safety) on job crafting. Because the independent variables were measured at two levels of analysis – (1) individual level (discretion and task complexity) and (2) team level (team psychological safety and task interdependence in the team), tests of the first set of hypotheses should be performed using a multi-level analysis package, such as Hierarchical Linear Modeling (HLM). HLM permits the analysis of multi-level data by simultaneously estimating effects across levels and partitioning explained variance by level (Raudenbush & Bryk, 2002). However, given the limited sample size at the team level of analysis (N=21), the power of the HLM analyses was severely restricted. Therefore, for testing the effects of the individual-level independent variables, I present here only the results using hierarchical linear regression analyses. The hypotheses were tested in two steps. In the first step, the dependent variables (the facets of job crafting) were regressed on the control variables. In step two, the dependent variables discretion and task complexity were independently added to the regression equation to test their incremental effect on job crafting. Given the lack of intercorrelation among the facets of job crafting, I tested the hypotheses separately using as dependent variable each facet of job crafting.

Predictors of Task Crafting. Because the dependent variable (task crafting) was ordinal with a non-normal distribution, the effects of the individual-level variables on task crafting were tested using an ordinal logistic regression analysis. An analysis of the distribution of the task crafting variable revealed that all employees were clustered around the values 2 to 4, three workers had a score of 1, and nobody had a score of 5. Therefore, I recoded the variable on a 1-to-3 scale, corresponding to low, medium, and high task crafting levels. The original task crafting scores of 1 and 2 were coded as low, scores of 3 were coded as medium, and scores of 4 were coded as high. The results of the ordinal logistic regressions are indicated in Table 8. First, skills had a strong significant positive effect on task crafting (β=1.63, $p<.01$)

beyond the effect of experience (Model 1), suggesting that workers with broader skills were more likely to engage in task crafting. As predicted, discretion in work had a significant positive effect on task crafting (β=.42, $p<.01$; Model 2), suggesting that individuals with higher discretion in work were more likely to engage in crafting their tasks. Task complexity had a marginal but positive relationship with task crafting (β=.26, $p<.10$; Model 3). Interestingly, the effects of discretion and complexity lost significance when skills were entered into the regression equation as a control variable (Model 4). One explanation for this finding might be the fact that both skills and task crafting were based on supervisor ratings. However, the skills measure was a historical measure of several skill dimensions used in the manufacturing process, archived by the company, and used for compensation purposes. Therefore the possibility of a high correlation between skills – a historical measure – and task crafting – a supervisor rating at the time of the study – was minimized.

Another possibility was that skills interacted with the independent variables of interest. Skills were central to the manufacturing process in the Volvo Uddevalla setting. Workers developed their skills continuously because it was believed that broader skills were key to achieving high levels of quality in the manufacturing process characterized by high levels of employee input. It is possible that workers were more likely to take advantage of the discretion in their work and craft their tasks when they had broader skills that allowed them to come up with new task approaches. Similarly, the broader their skills, the more likely it was that workers reporting higher task complexity engaged in more task crafting, because they had the skills necessary to deal with higher complexity levels in their work. Therefore, I ran two additional models to test a possible interaction effect between skills, and discretion and complexity, respectively. The results indicated there was a significant interaction effect between skills and discretion (Model 5), which is graphically shown in Figure 2. The interaction suggests that the broader the skills, the stronger the positive effect of discretion on task crafting ($F(1,127)=5.48$, $p<.05$). There was no significant interaction effect between discretion and task complexity, and therefore this analysis is not shown in the table.

Table 8 Predictors of Task Crafting

Variable	Task Crafting				
	Model 1	Model 2	Model 3	Model 4	Model 5
Experience	.00	.08	.06	.04	.00
Skills	1.63**			1.09**	1.08**
Discretion		.42**		.28	.21
Task complexity			.26†	.03	
Skills*Discretion					.46*
χ^2	27.22**	6.16*	2.98	30.95**	34.26**
Pseudo R^2	.11	.03	.01	.13	.14

** p≤0.01; * p≤0.05; † p≤0.1

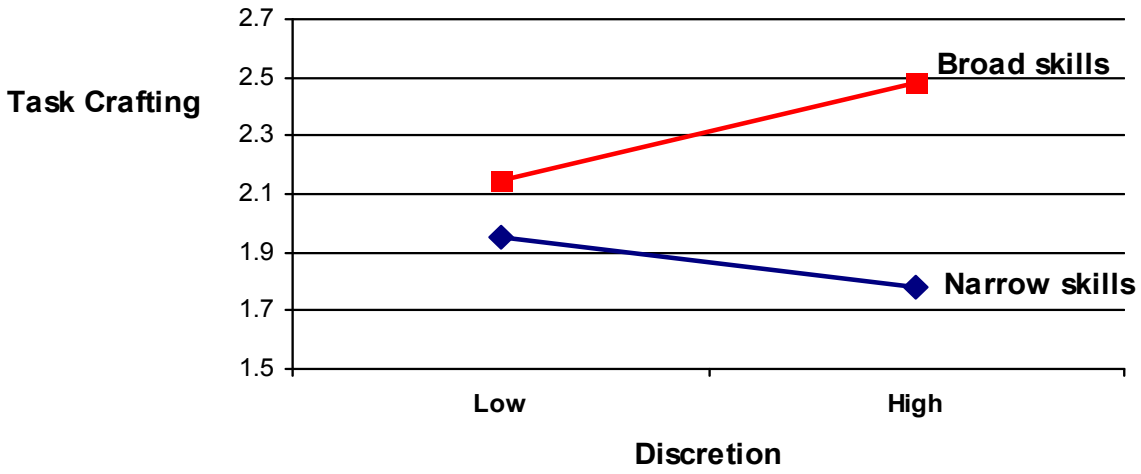


Figure 2 Interaction Effect between Skills and Discretion on Task Crafting

Predictors of Cognitive Crafting. The results of the hierarchical linear regressions to test the hypothesized effects of the predictors of cognitive crafting are presented in Table 9. The results indicate that, contrary to predictions, discretion had no significant effect on cognitive crafting (Model 2). However, as predicted, task complexity had a significant positive effect on cognitive crafting, as

hypothesized (β=.18, p<.01; Model 3). As Model 4 suggests, the effect of task complexity remained significant once all independent variables were entered into the regression equation. Similar to the task crafting analysis, a model with interaction effects between skills, and discretion and complexity, respectively, was tested. No significant results were found for the interaction models in this case.

Table 9 Predictors of Cognitive Crafting

Variable	Cognitive Crafting			
	Model 1	**Model 2**	**Model 3**	**Model 4**
Experience	.00	.00	.01	.00
Skills	.08	.08	.04	.05
Discretion		-.02		-.09
Task complexity			.18*	.21*
F	.38			
Change in F (from Model 1)		.04	3.81*	2.34†
Adjusted R^2	.00	.00	.01	.01

** p≤0.01; * p≤0.05; † p≤0.1

Predictors of Relational Crafting. I conducted hierarchical linear regressions to test the hypothesized effects of the predictors of relational crafting. The results of the regressions are indicated in Table 10. Model 1 shows that among the control variables, skills had a marginal positive effect on relational crafting (β=.18, p<.10), with more skilled employees being likely to engage in more relational crafting. As predicted, discretion had a positive significant effect on relational crafting (β=.22, p<.01), suggesting that workers reporting higher levels of discretion in work were more likely to engage in relational crafting through interaction with other employee groups outside their team (Model 2) . As predicted, task complexity had a significant positive effect on relational crafting (β=.24, p<.01), suggesting that workers who reported higher levels of complexity in their work were more likely to engage in relational crafting through interaction with other employee groups outside their team (Model 3).

Model 4 indicates that both discretion and task complexity remained significant once I controlled for skills. A model with interaction effects between skills, and discretion and complexity, respectively, was tested as in the task crafting case. No significant results were found for the interaction models in this case.

Table 10 Predictors of Relational Crafting

Variable	Relational Crafting			
	Model 1	**Model 2**	**Model 3**	**Model 4**
Experience	-.14	-.10	-.12	-.10
Skills	.18†	.15†	.13	.12
Discretion		.22**		.15†
Task complexity			.24**	.18*
F	2.74†			
Change in F (from Model 1)		5.95**	7.13**	4.91**
Adjusted R^2	.03	.07	.08	.09

** p≤0.01; * p≤0.05; † p≤0.1

Team-level Influences on Job Crafting. As indicated in the beginning of this section, I used hierarchical linear modeling (HLM; Raudenbush & Bryk, 2002) to test the cross-level effects of team factors on individual job crafting. Given the nested structure of the data in this study, with individuals embedded in teams, I specified individuals as the level-1 data and the teams as the level-2 data. The sample on which I conducted the HLM analyses is a subsample of the full data set. This subsample includes only 70 individuals, who were members of the 21 teams constructed from the product build sheets provided by the company. Therefore, the power of the HLM analyses was severely restricted by the small sample size at the team level.

The HLM results are shown in Table 11. As shown in Table 11, in the case of task crafting the proportion of variance at the team level was very small (ρ=3.1%). None of the team variables had a significant effect on task crafting, although the signs were in the hypothesized direction (negative effect

of task interdependence, positive effect of team psychological safety) . As suggested earlier, this might be due to the small sample size at the team level, which reduced significantly the power of the HLM analyses.

Table 11 Team-level Predictors of Job Crafting

Team-level Variable	Coefficient γ		
	Task Crafting	**Cognitive Crafting**	**Relational Crafting**
Total variance at team level (ρ)	3.1%	0.1%	11.0%
Team interdependence	-0.21	0.29	0.08
Team psychological safety	0.26	-0.95*	-1.17*
χ-square (df)	40.31** (18)	12.27 (18)	22.60 (18)

N=21 teams
** p≤0.01; * p≤0.05; † p≤0.1

In the case of cognitive crafting, the proportion of variance at the team level was very small (ρ=.1%), indicating that almost all variance in cognitive crafting was explained by individual -level variables. The HLM results indicated that team psychological safety had a significant negative effect on cognitive crafting (γ=-.95, p<.05). Further, team interdependence did not have a significant effect on cognitive crafting.

In the case of relational crafting, the proportion of variance at the team level was larger (ρ=11.0%). Contrary to predictions, team psychological safety had a significant negative effect on relational crafting (γ=-1.17, p<.05). This suggests that workers whose teams had higher levels of team psychological safety were likely to engage in less relational crafting through interaction with other employee groups. One potential explanation of this finding would be that workers might have interpreted this as team cohesion rather than safety, and answered the questions accordingly. Individuals might have

implicit theories about how things happen in teams (Guzzo & Dickson, 1996) and as a result, they might infer they are cohesive as a team, because they think cohesiveness is related to performance. Finally, task interdependence had no significant effect on relational crafting.

To assess whether the lack of significance of the effects of the team-level variables is due to sample size issues at the team level, I conducted power analyses using Optimal Design for Longitudinal and Multilevel Research developed by Raudenbush, Spybrook, Liu, and Congdon (2006). Optimal Design allows the calculation of the target number of level-2 units (i.e., teams) and thus the corresponding target sample size for the multilevel analysis to achieve a certain power, given a desired effect size. For this analysis, I specified the average team size of 3.43, the variance between teams calculated using the ANOVA model in HLM ρ=0.03, and two levels of effect size for illustrative purposes: δ=0.40 and δ=0.30. The results of the power analysis are summarized in Table 12 and graphically illustrated in Figure 3.

Table 12 Power Analysis for the Two-Level Model

Power	Effect size	Target number of teams	Corresponding sample size
0.80	0.40	72	247
	0.30	125	429
0.70	0.40	57	196
	0.30	99	340
0.50	0.40	36	123
	0.30	63	216
0.30	0.40	20	69
	0.30	34	117

The power analysis indicates that to achieve a power of 0.80, I would have needed 72 teams (and a corresponding sample size of 247 individuals) for an effect size of 0.40 and 125 teams (and a corresponding sample size of 429 individuals) for an effect size of 0.30. Given the context of Study 1,

these target sample sizes were not possible to achieve. To illustrate the differences, Table 12 also shows the target number of teams and corresponding sample sizes for achieving levels of power of 0.70, 0.50., and -- as an extreme case -- 0.30. It suggests that for the current sample size at team level (21 teams) and 70 individuals in these teams, the power of the multi-level analysis was just above 0.30 for an effect size of 0.40.

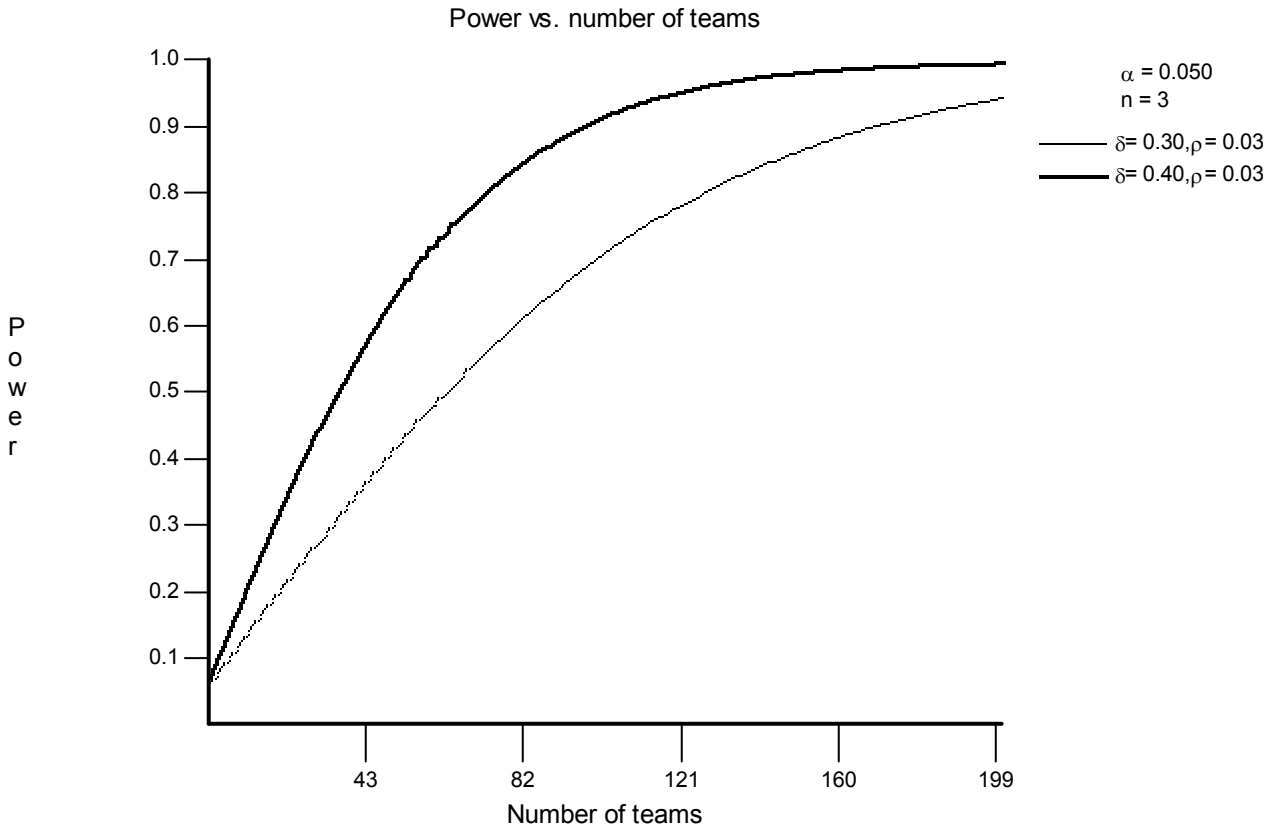


Figure 3 Power Analysis: Power versus Number of Teams

In summary for the predictors of job crafting, the predicted effects of discretion were supported for all but the cognitive facet of job crafting. I found full support for the predicted effect of task complexity on all facets of job crafting. I found no support for the effects of task interdependence on job crafting. Finally, the hypothesized effects of team psychological safety received no support.

5.3.2 Outcomes of Job Crafting

The second set of hypotheses proposed a direct effect of job crafting on several outcome variables of interest (job satisfaction, organizational commitment, job effectiveness, and absenteeism). I tested the effects of the job crafting variables on each of the outcomes of interest. The results are presented in Table 13 and Table 14.

Effects on Job Effectiveness. I explored two aspects of job effectiveness – output quality and job efficiency. Because the dependent variables (quality and efficiency) were ordinal, with a non-normal distribution, the effects of the job crafting variables on the dependent variables were tested using an ordinal logistic regression analysis. An analysis of the distribution of the quality and efficiency variables revealed that all employees were clustered around the values 2 to 4, with only one worker having a score of 1 in each case, and no worker with a score of 5. Therefore, I recoded the variable on a 1-to-3 scale, corresponding to low, medium, and high quality and efficiency levels, respectively. The original quality and efficiency scores of 1 and 2 were coded as low, scores of 3 were coded as medium, and scores of 4 were coded as high. The results of the ordinal logistic regressions are indicated in Table 13.

The analyses for quality (first half of Table 13) indicate that, among the control variables, task complexity had a negative effect on quality (β=-.61, $p<.05$), suggesting that task complexity hindered workers' achievement of high quality results (Model 1a). As expected, experience had a positive effect on quality (β=.33, $p<.01$), but this became marginal once the job crafting variables were entered into the regression equation (Model 2a). Further, among the job crafting facets, task crafting had a significant positive effect on the quality of results, as hypothesized (β=2.26, $p<.01$). This effect remained significant after controlling for worker experience, skills, discretion, and task complexity levels. Relational crafting did not have a significant effect on quality levels. I thought it would be interesting to explore the relative effects of the two facets of relational crafting on quality and ran an additional analysis using relational range and strength of interaction instead of the global relational crafting index (Model 3a). Among the relational crafting facets, strength of interaction had a significant positive effect on quality, as expected (β=.98, $p<.05$). In contrast, range of interaction had a marginal negative effect on quality (β= -2.65,

p<.10). These results suggest that individuals with more frequent interactions with external others had superior quality outcomes, but that broader networks of relationships did not help them in achieving higher quality. Finally, cognitive crafting had no significant effect on quality.

Table 13 Outcomes of Job Crafting: Job Effectiveness

	Job Effectiveness					
	Quality			**Efficiency**		
Variable	**Model 1a**	**Model 2a**	**Model 3a**	**Model 1b**	**Model 2b**	**Model 3b**
Experience	.33*	.32†	.32†	.32*	.24	.25
Skills	.50	-.17	-.15	.41	-.31	-.29
Discretion	.14	.12	.13	.13	.14	.14
Task complexity	-.32	-.61*	-.60*	-.45*	-.83**	-.82**
Job crafting						
Task crafting		2.26**	2.28**		2.25**	2.21**
Relational crafting		.15			.22†	
Range of interaction			*-2.65†*			*-.99*
Strength of interaction			*.98**			*.73†*
Cognitive crafting		.13	.12		.13	.10
χ^2	10.99*	45.57**	50.74**	12.57*	47.77**	49.67**
Pseudo R^2	.06	.27	.29	.07	.27	.28

** p≤0.01; * p≤0.05; † p≤0.1

The analyses for efficiency indicate that, among the control variables, task complexity had a significant negative effect on efficiency (β=-.45, p<.01), suggesting that higher levels of complexity hindered workers' efficiency levels (Model 1b). Further, experience levels had a significant positive effect on efficiency (β=.32, p<.05), but this effect disappeared once the job crafting variables were entered into the regression equation (Model 2b). Task crafting had a significant positive effect on efficiency (β=2.25, p<.01), as predicted, suggesting that workers who engaged in more task crafting were more likely to achieve higher efficiency in their work. Relational crafting had a marginally significant positive effect on efficiency (β=.22, p<.10), as predicted, with workers who engaged in more relational crafting being more likely to exhibit higher efficiency levels. I thought it would be interesting to explore the relative effects of the two facets of relational crafting on efficiency and ran an additional analysis using relational range and strength of interaction instead of the global relational crafting index (Model 3b). Range of interaction had no significant effect on efficiency. However, as expected, strength of interaction had a marginal positive effect on efficiency (β=.73, p<.10), suggesting that workers who had more frequent interactions with other employee groups were more likely to achieve higher levels of efficiency. Finally, cognitive crafting had no significant effect on individual efficiency.

Effects on Job Satisfaction and Organizational Commitment. The results of the regression analyses for job satisfaction and organizational commitment are presented in Table 14.

Job Satisfaction. Discretion had a marginal positive effect on job satisfaction (β=.27, p<.01), with higher discretion levels being associated with higher levels of job satisfaction (Model 1a, Table 14). Experience, skills, and task complexity had no significant effect on job satisfaction. Model 2a in Table 14 indicates that, among the job crafting facets, only cognitive crafting had a significant positive effect on job satisfaction (β=.27, p<.01), while task and relational crafting had no significant effect.

Organizational Commitment. Discretion had a marginal positive effect on commitment (β=.27, p<.01), with higher discretion levels being associated with higher levels of organizational commitment (Model 1b, Table 14). Experience, skills, and task complexity had no significant effect on commitment. Model 2b in Table 14 indicates that, among the job crafting facets, both task and cognitive crafting had a

significant positive effect on job satisfaction, while relational crafting had no significant effect. In particular, task crafting had a marginally significant positive effect on commitment (β=16, p<.10), suggesting that workers who engaged in more task crafting were more likely to exhibit higher commitment to the organization. In addition, cognitive crafting had a significant positive effect on commitment (β=.27, p<.01). These findings have important implications for understanding what work-related factors can make workers stay with their organization, highlighting the role of job crafting in achieving higher levels of organizational attachment.

Effects on Absenteeism. As previously indicated, to reduce the skewness of the absenteeism data, I followed recommendations from previous literature and applied a log transformation to the data. Since absenteeism was a count variable capturing the number of days an employee was absent in a two-month period after the administration of the surveys, I conducted Poisson regression analyses to test the effects of job crafting facets on absenteeism (Models 1c and 2c in Table 14). As expected, experience levels had a marginally significant effect on absenteeism (β=-.17, p<.10), with more experienced workers being less likely to be absent from work. As predicted, task crafting had a marginal negative effect on absenteeism (β=-.39, p<.10), indicating that individuals who engaged in more task crafting were less likel y to be absent from work. Relational and cognitive crafting had no significant effect on absenteeism levels. The finding that job crafting (in particular, task crafting) was related to lower absenteeism levels is encouraging in this particular setting, given the high absenteeism problem that the company was facing. Volvo Uddevalla was confronting high absenteeism levels, in part due to some specific Swedish labor market issues (e.g., a highly educated, generally younger workforce, and a tight labor market). One reason for implementing the highly autonomous, team-based work system was to enhance worker motivation and thus increase job satisfaction and reduce absenteeism levels. The results of this study indicate that workers who took advantage of the discretion built into work and engaged in more extensive task crafting were less likely to be absent from work. Thus, job crafting can constitute one avenue through which workers can enjoy their work more and therefore be less absent from work.

Table 14 Outcomes of Job Crafting: Job Satisfaction and Absenteeism

	Dependent Variable					
	Job Satisfaction		Organizational Commitment		Absenteeism	
Variable	**Model 1a**	**Model 2a**	**Model 1b**	**Model 2b**	**Model 1c**	**Model 2c**
Intercept					.16	.26
Experience	.07	.06	.09	.08	-.17†	-.17*
Skills	.01	-.01	.06	-.02	-.04	.04
Discretion	.27**	.31**	.27**	.28**	.06	.01
Task complexity	.12	.09	.10	.03	-.13	-.12
Job crafting						
Task crafting		.08		.16†		-.39†
Relational crafting		-.12		-.01		.18
Cognitive crafting		.27**		.27**		-.02
F	3.69**		3.54**			
Change in F (from Model 1)		4.27**		4.33**		
Adjusted R^2	.08	.16	.08	.15		
χ^2					4.73	11.14
Pseudo R^2					.06	.15

** p≤0.01; * p≤0.05; † p≤0.1

5.3.3 Additional Analyses

As seen in the previous analyses, job crafting can positively influence individuals' affective outcomes (job satisfaction, organizational commitment) and job performance (quality of results, efficiency level). Given the interdependent nature of work in this setting (i.e., teamwork), there are at least two additional questions that deserve further attention. First, to what extent does individual job crafting affect team-level outcomes of interest? When employees work in team settings where they are interdependent with other team members, their job crafting can influence others' job crafting efforts, with consequences for team functioning and performance, as a whole. This question should be of interest to managers in organizations implementing team-based work systems. If managers are to realize the value of job crafting in their organizations, they need to pay attention to the influences that individual job crafting can have not only on individual performance, but also on team or work unit performance as a whole. Second, what are the boundary conditions of job crafting? In other words, what are the factors moderating the effects of job crafting on the outcomes of interest? I address these two additional questions in the next exploratory analyses.

Team Outcomes of Job Crafting. First, I explored the team-level consequences of individual job crafting. I created an objective measure of team productivity from archival information (product build sheets). To create this measure, I calculated the number of vehicles assembled by each team in a two-week period after the administration of the survey. Regression analyses using team mean levels of task, cognitive, and relational crafting did not reveal any significant effect of individual job crafting on team productivity. Several curvilinear models were also run, but did not produce significant results. The lack of significance of the regression results at the team level of analysis is due to the small sample size that reduced considerably the power of the analysis. Despite the lack of significance in the regression analysis, I thought it would be interesting to explore the effects of individual job crafting on team productivity using t-tests. I separated the teams in two groups having low and high levels of members' task, relational, and cognitive crafting, respectively, using a median split along each of the three facets of job crafting. I

conducted t-tests to examine significant differences between the two groups on the team productivity variable. The results of the t-tests analyses are graphically illustrated in Figure 4. Results indicated that task crafting had a significant positive effect on team performance, with teams whose members engaged in more task crafting having significantly higher performance than teams whose members engaged in less task crafting (38.04 compared to 24.28; t=2 .07, p<.05). Relational crafting and cognitive crafting had no significant effect on team performance. These preliminary findings suggest that individual job crafting has implications that go beyond the focal individual and can positively impact outcomes a t the team level. Teams whose members engaged in more task crafting were better able to improve their productivity levels than teams whose members engaged in less task crafting.

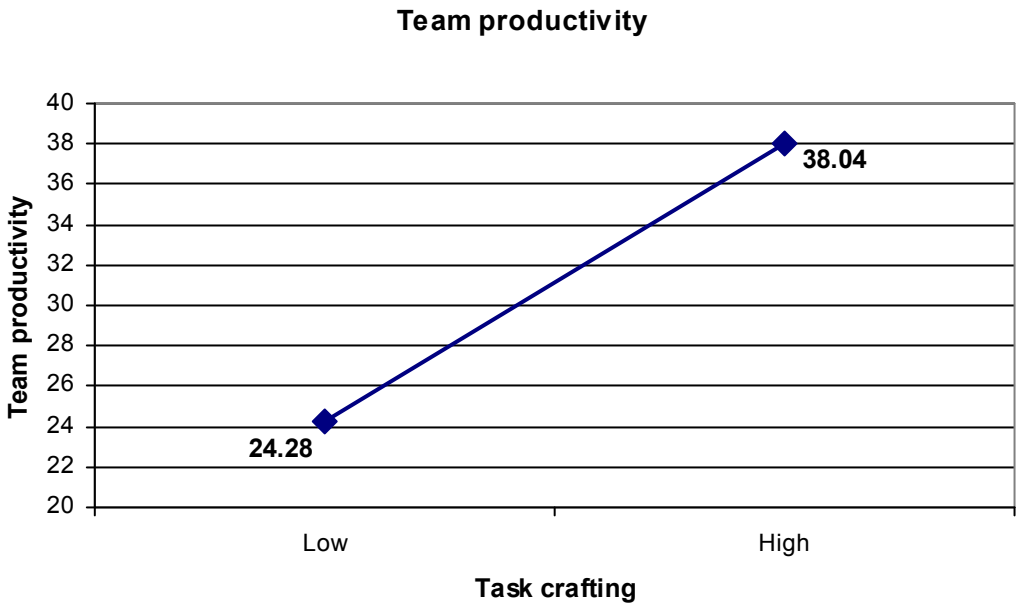


Figure 4 Effects of Task Crafting on an Objective Measure of Team Productivity

Moderating Factors on the Effects of Job Crafting. Second, I explored potential moderators of the effects of job crafting on the outcomes of interest. I propose that the impact of job crafting on effectiveness outcomes could be moderated by individual skills and task complexity, and the impact on

job satisfaction could be moderated by task interdependence in the team. In this section, I outline the theoretical rationale and explore empirically the potential moderating influences on the effects of job crafting.

Skills as Moderator. Individual skills can play a significant role in shaping job outcomes when individuals engage in job crafting. This is because broad skills open up new possibilities for crafting an individual's job in new ways and enhance the quality of these alternative ways of performing the tasks. Workers with broader skills will more likely use their broader knowledge to shape their tasks in superior ways, by improving work routines and procedures. Thus, workers with broader skills will not only be more likely to craft their jobs in new ways, but will also be more likely to do that in superior ways compared to those with narrower skills. The broader skills will give individuals a broader perspective on work processes and a better understanding of the interconnections between their work and others'. As a consequence, they will be better able to craft their jobs in ways that are not only better suited to their individual needs and motivations at work, but also superior in terms of task effectiveness. In sum, I would expect that skills moderate the effect of job crafting on job effectiveness, such that the broader a worker's skills, the stronger the effect of job crafting on job effectiveness.

The moderation effects of skills were tested using hierarchical regression analysis with interaction terms. Given the ordinal nature of the dependent variables (quality and efficiency) and their non-normal distribution, ordinal logistic regression analyses were performed. To test the moderating effects of skills, in a first step, the dependent variables (quality and efficiency, respectively) were regressed on the control variables and the job crafting variables (for quality: Table 15, Model 1a; for efficiency: Table 15, Model 1b). In a second step, I added in the regression equation the interaction terms between skills and each facet of job crafting (for quality: Table 15, Model 2a; for efficiency: Table 15, Model 2b). A significant regression coefficient for the interaction term, when also considering the skills variable and the job crafting facet variables, would provide evidence of a significant moderation effect. An examination of Models 2a and 2b in Table 15 reveals that the interaction terms representing the cross-product of skills

and each of the job crafting facets were not significant, suggesting that skills did not moderate the impact of job crafting on quality or efficiency outcomes.

Task Complexity as Moderator. When workers try new ways of doing their tasks (i.e., job crafting), they are more likely to maximize the range of possible responses to complex problems encountered in their work. Tasks that are more complex are more likely to require more extensive exploration activities (March, 1991). When tasks are more complex, individuals who craft their jobs more are likely to be better equipped with novel task strategies and ideas to address the complexity levels present in their work. This is because in their crafting they might have come across new routines or task sequences that can address complex task situations in superior ways. In contrast, individuals who craft their jobs less are likely to engage in the same routines or tasks strategies, or become trapped in "habitual routines" (Gersick and Hackman, 1990), which might not be effective when dealing with more complex tasks. Thus, some individuals might engage in certain task strategies that they believe will lead to effective performance, but because of the inherent complexity in the task, their chance of actually achieving effective performance is low. In sum, I would expect that task complexity moderate the effect of job crafting on job effectiveness, such that the more complex the task, the stronger the effect of job crafting on job effectiveness.

The moderation effects of task complexity were tested using hierarchical regression analysis with interaction terms. In a first step, the dependent variables (quality and efficiency, respectively) were regressed on the control variables and the job crafting variables (for quality: Table 15, Model 1a; for efficiency: Table 15, Model 1b). In a second step, I added in the regression equation the interaction terms between task complexity and each facet of job crafting (for quality: Table 15, Models 3a; for efficiency: Table 15, Models 3b). An examination of Models 3a and 3b in Table 15 reveals that the interaction term representing the cross-product of task complexity and each of the job crafting facets were not significant, suggesting that task complexity did not moderate the effect of job crafting on quality or efficiency outcomes.

Task Interdependence as Moderator. Finally, task interdependence in the team is likely to influence the effects of job crafting on job satisfaction. When workers are more interdependent with their team mates, a worker's job crafting is more likely to impact and interact with his or her team mates' job crafting than in less interdependent teams. In less interdependent teams, workers feel they have more freedom to experiment with tasks and craft their jobs, whereas in more interdependent teams, they are more likely to feel constrained and limited in their actions by their team mates' actions. Therefore, more interdependent workers who engage in more job crafting will be less satisfied with their jobs than less interdependent workers, because increased interdependence will constrain the positive effects of job crafting and make them more a function of what teammates do in their jobs rather than on how the focal individual approaches his or her work. Thus, I expect that task interdependence in the team moderate the effect of job crafting on job satisfaction, such that the more interdependent the team, the lower the positive effect of job crafting on job satisfaction.

The moderation effects of task interdependence were tested using hierarchical regression analysis with interaction terms. In a first step, the dependent variable (job satisfaction) was regressed on the control variables and the job crafting variables (Table 16, Model 1). In a second step, I added in the regression equation the interaction terms between task interdependence and each facet of job crafting (Table 16, Model 2). An examination of Model 2 reveals that the interaction terms representing the cross-product of task interdependence and each facet of job crafting were not significant, suggesting that task interdependence in the team did not moderate the effect of job crafting on individual job satisfaction.

Table 15 Moderated Regressions for Outcomes of Job Crafting: Job Effectiveness

Variable	Job Effectiveness					
	Quality			Efficiency		
	Model 1a	Model 2a (Skills as moderator)	Model 3a (Complex. as moderator)	Model 1b	Model 2b (Skills as moderator)	Model 3b (Complex. as moderator)
Experience	.32†	.35*	.35*	.24	.26†	.27†
Skills	-.17	-.28	-.26	-.31	-.30	-.37
Discretion	.12	.26	.14	.14	.18	.13
Task complexity	-.61*	-.73*	-.70*	-.83**	-.91**	-.85**
Job crafting						
Task crafting	2.26**	1.65**	1.66**	2.25**	1.65**	1.60**
Relational crafting	.13	.15	.15	.22†	.23†	.23
Cognitive crafting	.15	.24	.20	.13	.20	.15
Interaction terms						
Skills*Task crafting		-.22			.00	
Skills*Relational crafting		.13			.08	
Skills*Cognitive crafting		.59			.43	
Complexity*Task crafting			-.31			-.02
Complexity*Relational crafting			.13			.10
Complexity*Cognitive crafting			-.32			-.25
χ^2	45.57**	49.36**	47.71**	47.77**	49.10**	48.73**
Pseudo R^2	.27	.34	.28	.27	.28	.28

** p≤0.01; * p≤0.05; † p≤0.1

Table 16 Moderated Regressions for Outcomes of Job Crafting: Job Satisfaction

Variable	Job Satisfaction	
	Model 1	**Model 2** (Interdependence as moderator)
Experience	.19	.19
Skills	.06	.05
Discretion	.26†	.26†
Task complexity	.02	.01
Task interdependence	.29*	.29†
Job crafting		
Task crafting	.22	.22
Relational crafting	.03	.05
Cognitive crafting	.22†	.24†
Interaction terms		
Interd.*Task crafting		-.01
Interd.*Relational crafting		-.03
Interd.*Cognitive crafting		.06
F	2.270*	
Change in F		.058
Adjusted R^2	.15	.10

** p≤0.01; * p≤0.05; † p≤0.1

5.4 SUMMARY OF RESULTS STUDY 1

This section summarizes the results of the statistical analyses conducted to test the hypotheses in Study 1. A summary of the hypotheses tests discussed below is presented in Table 17.

Hypothesis H1 posited that discretion in work would significantly predict job crafting behaviors. As predicted, discretion had a significant positive effect on both task and relational crafting, but no significant effect on cognitive crafting. Therefore, Hypotheses H1 received partial support in Study 1. Further, skills had a significant moderating effect on the impact of discretion on task crafting, suggesting that the positive effect of discretion on task crafting was stronger for broader than for narrower individual skills. This result underscores the importance of skills in this setting, where many workers acquired broader skills used in the car assembly process. It highlights the idea that whereas discretion provides opportunities for task crafting, it is skills that channel how discretion is used by workers engaged in the assembly tasks.

Hypothesis H2 stated that task complexity would significantly predict job crafting behaviors. As predicted, I found that task complexity had a significant and positive effect on each of the three facets of job crafting. Workers who experienced increased levels of task complexity were more likely to engage in higher levels of task, relational, and cognitive crafting. Therefore, hypothesis H2 received full support in Study 1.

According to hypothesis H3, task interdependence in the team would significantly and negatively influence job crafting. Contrary to predictions, I found no significant support for the effect of task interdependence. Therefore, hypothesis H3 was not supported in Study 1.

Hypothesis H4 predicted that team psychological safety would significantly and positively affect job crafting. Contrary to predictions, team psychological safety had no significant effect on task crafting. Moreover, team psychological safety had a significant negative effect on both relational and cognitive crafting, suggesting that individuals in teams with higher levels of psychological safety were likely to engage in lower levels of relational and cognitive crafting. Therefore, hypothesis H4 was not supported.

A final set of hypotheses predicted that job crafting would have important implications for several outcomes of interest (hypotheses H6 and H7). Hypothesis H6 predicted that job crafting would have a significant positive effect on job satisfaction and organizational commitment, and would significantly and negatively affect individual absenteeism.

First, although task and relational crafting had no significant effect on job satisfaction, cognitive crafting had a significant positive effect on job satisfaction, indicating partial support for the predicted effect of job crafting on satisfaction. Second, both task and cognitive crafting had a significant positive effect on organizational commitment, whereas relational crafting had no significant effect on commitment. These results indicate partial support for the predicted effect of job crafting on commitment. Third, although relational and cognitive crafting had no significant effect on absenteeism levels, task crafting had a significant negative effect on individual absenteeism, indicating partial support for the predicted effect of crafting on absenteeism.

Given that cognitive crafting, job satisfaction, and organizational commitment were reported from the same source (self-reports of individual workers), some of the test results supporting hypothesis H6 are potentially subject to single-source response bias. However, the significant effects of task crafting (a supervisor assessment) on organizational commitment (self-report of workers) and individual absenteeism (an objective, archival measure) provide a stronger test of the hypothesis. In sum, hypothesis H6 was partially supported.

Hypothesis H7 predicted that job crafting would significantly and positively influence job effectiveness. The test results indicated that task crafting significantly and positively influenced both quality and efficiency outcomes. Further, relational crafting had a significant positive effect on efficiency outcomes and no significant effect on quality results. Cognitive crafting had no significant effect on job effectiveness outcomes.

A more fine-grained analysis of relational crafting using range and strength of interaction as facets instead of relational crafting indicated that range and strength of interaction have opposite effects on effectiveness. Whereas strength of interaction had a significant positive effect on both quality and efficiency outcomes, range of interaction had a significant negative effect on quality and no effect on efficiency. Thus, although individuals with stronger, more frequent relationships with other employees outside their team achieved better quality and efficiency levels in their work, those who had broader networks of interactions with others scored lower on quality of results. This highlights the importance of crafting relationships with others to accomplish work goals, suggesting that more relational crafting has generally a positive impact on job effectiveness, but that the positive effects are mainly due to stronger relationships and might be mitigated by broader networks. In sum, these results indicate partial support for hypothesis H7.

Table 17 Summary of Hypotheses Testing Results Study 1

Hypothesis	Predicted relationship	Job Crafting			Summary
		Task Crafting	Relational Crafting	Cognitive Crafting	
H1	Discretion → Job crafting (+)	**.42** (supp.)** skills moderate .46**	**.22** (supp.)**	-.02	**Partially supported**
H2	Task complexity → Job crafting (+)	**.26† (supp.)**	**.24** (supp.)**	**.18* (supp.)**	**Supported**
H3	Task interdependence → Job crafting (-)	-.21	.08	.29	**Not supported**
H4	Team psychological safety → Job crafting (+)	.26	-1.17*	-.95*	**Not supported**
H5	*Not in Study 1*	-	-	-	**-**
H6	*Job crafting → Affective outcomes (+)* → Job satisfaction (+) → Organizational commitment (+) → Absenteeism (-)	 .08 **.16† (supp.)** **-.39† (supp.)**	 -.12 -.01 .18	 **.27** (supp.)** **.27** (supp.)** -.02	**Partially supported**
H7	*Job crafting → Job effectiveness (+)* → Quality (+) → Efficiency (+)	 **2.26** (supp.)** **2.25** (supp.)**	 .15 **.22† (supp.)**	 .13 .13	**Partially supported**

** p≤0.01; * p≤0.05; † p≤0.1

6.0 STUDY 2 - PROFESSIONAL WORK IN SCHOOLS

This chapter describes job crafting in the second research setting in which this dissertation was conducted, the specific hypotheses and the research methods used to test these hypotheses. I describe the operationalization of the constructs explored in the study. I also discuss the results of the factor analyses and report the scale reliabilities of the multiple-item scales used in the study.

6.1 WORK CONTEXT

Service workers are one of the occupations that define the changing nature of work in the late twentieth century, but have been largely overlooked in most studies of organizational work (Barley & Kunda, 2001). This study focuses on one particular group of service workers – special education teachers in public schools. The data for the study was collected in 200 elementary schools in a large urban public school district in the United States.

As a knowledge-intensive occupation that deals with multiple, complex demands from students with various learning needs, the special education teaching profession is a good setting to explore job crafting, for several reasons. First, broad skills are key to special education teachers' jobs, because teachers need to juggle simultaneously tasks that involve mastering the general curriculum knowledge and tasks that involve mastering specific approaches to adapt teaching to the various needs of students. Second, the work is highly ambiguous. Even though on the surface it may seen there is a right way to do this work, in reality there is no right way to approach such work. Teachers need to continuously craft new approaches to tailor and expand their work practice, to accommodate various demands and complex situations. Third, meeting the learning needs of different students and making a difference for students

with learning disabilities is the central focus of these teachers' work and comes to define their work identity. Only teachers who love the challenges of this work stay in this profession, whereas many others leave the special education profession.

Finally, tailoring and expanding tasks through job crafting can be central to motivating and retaining special education teachers. Turnover among special education teachers is especially costly, given the need for these teachers to have special certifications and masters degrees to perform their jobs. Quit rates are quite high among teachers in general, in many urban districts. They are even higher among special education teachers, whose work is very demanding and who often face increased resource shortages and lack of support in their schools. Therefore, examining what job crafting means in this context, the factors influencing it and its outcomes, is an important endeavor for understanding how organizations (i.e., schools) can motivate, engage, and retain these critical professionals.

At the time of the study, a recent innovative initiative altering the work design of teachers involved in teaching special education classes was in progress in the district under study. As part of a broader effort at the district level to "mainstream" special education children into general education (Bauwens & Hourcade, 1991) by providing them with the "least restrictive environment" for learning, and in the context of a general increased shortage of certified special education teachers (Kozleski, Mainzer, & Deschler, 2000), the district under study was introducing collaborative team teaching arrangements in all schools. The collaborative team teaching setting brought together in each classroom two teachers – one special education teacher and one general education teacher – who work collaboratively and deliver instruction for both general education children and children with special needs.

Traditionally, special education teachers' work was done by either (1) pulling a student out of a general classroom into tutoring sessions or resource rooms (e.g., special education teacher support services or SETSS), or (2) teaching students in separate classrooms which only serve students with disabilities (e.g., self-contained classes). In contrast, collaborative team teaching has been defined as a service delivery system in which two teachers, one general education and one special education, contract to share instructional responsibility for a single group of students. Instruction takes place primarily in a

single classroom or workspace, for specific objectives, with mutual ownership, pooled resources, and joint accountability (Cook & Friend, 1995; Walther-Thomas, et al., 1996; Friend & Cook, 2002).

However, in the district explored, the initiative was in its initial stages of implementation and was emphasized with different degrees by the leadership of the different regions in the district. As a consequence, schools differed widely in the extent to which they had classes using the innovative work arrangement. In many schools, only traditional forms of teaching special education classes were used. In other schools, there was a blend of traditional forms of teaching special education and innovative collaborative team teaching classes. The variability across schools in the extent to which collaborative team teaching was used provided an interesting opportunity to study differences in relational and situational factors and their effects on teachers' job crafting.

The literature indicates three types of barriers to the introduction of collaborative team teaching arrangements – organizational, attitudinal, and knowledge barriers (Kochlar, West, & Taymans, 2000). Organizational barriers generally refer to the lack of resources necessary to adopt the new practice, such as financial resources to train the special education and general education teachers to work cooperatively and teach both regular students and students with disabilities or learning needs, and the need to hire extra faculty to use as co-teachers, because of the class size recommendations of the National Education Association (Hines, 2001). Some of the attitudinal barriers identified in empirical work are teachers' feelings that they are unprepared to work in these settings and their resistance to the shift in control from an individual to a shared work environment (Mastropieri & Scruggs, 2000; Hines & Johnston, 1997). Finally, knowledge barriers occur because many general education teachers do not have the necessary training for working with students with special needs, and many special education teachers are not content experts especially in middle level classes (Hines, 2001).

The lack of resources to train teachers in these practices and implement the innovative arrangements in schools has created a situation where the different regions in the district have introduced the practice only in some schools and only to a limited degree. For example, at the time when the survey was being administered, a region was placing more emphasis on collaborative team teaching than the

other regions, by establishing the introduction of the practice as a regional strategy for special education services. Therefore, the region introduced the practice in many schools and began training some of the teachers in how to effectively use the practice. Thus, at the time when the surveys were being administered, the schools included in the survey differed to a large extent on the degree to which the innovative practice was being implemented. Further, since only a few teachers had been trained in the practice by the time the surveys were administered, most teachers were lacking the skills necessary for these collaborative arrangements.

6.1.1 Occupational Community of Practice

Although teachers in general constitute a professional community of practice (Louis, Marks, & Kruse 1996), special education teachers form a distinct group in most schools. Special education teachers have a distinct educational background from other teachers in their schools, because they must possess certification through a Masters degree in special education, which gives them the knowledge and skills to teach students with different types of learning needs. Further, in most schools explored in this study, a majority of special education teachers still worked in traditional classroom arrangements that fostered their isolation and limited communication with the larger community of regular education teachers in their school.

Therefore the schools under exploration were organizations where two related, or neighboring professional communities coexisted. In some cases, school administration supported and fostered communication between the two communities by providing common training, ensuring common planning time, or introducing more collaborative teaching arrangements. In other schools, the boundaries between the two communities of practice were more clearly defined and maintained through work arrangements that limited teachers' interaction and by a lack of administrative support for cross-professional collaboration. Boundaries between the two communities of practice were sometimes also reinforced by teachers' traditional sense of autonomy in their work, which creates resistance to outside intrusions in their classroom practice.

In particular, the practice of special education teachers was centered on "differentiation of instruction" (Tomlinson 2000). Originally developed for the instruction of high-end learners, the model has been adopted as teaching approach in special education environments where students with different disabilities are instructed. The model emphasizes some general principles of differentiation that teachers should use to differentiate content, process, and products (e.g., "flexible grouping", "respectful tasks", or "ongoing assessment and adjustment"). However, it was at the special education teachers' latitude to actually craft their work to achieve differentiation. Therefore, the teachers decided what specific practices they used in their classes to adapt their teaching to diverse student needs, by crafting their work in various ways. Observations of special education teachers doing their work in classrooms and several discussions with teachers revealed a broad array of different practices that teachers used in their work to differentiate instruction, suggesting that job crafting was a significant part of a special education teacher's work. Appendix C illustrates some examples of teaching strategies that some of the teachers observed or interviewed used in their classroom practice.

Adapting the instruction to students' needs was the core task of special education teachers' work. Therefore, the two occupational communities in schools had two distinct task domains that defined them in the professional context. Regular education teachers' task domain was the content knowledge to be delivered in instruction, whereas special education teachers' core task domain was adapting the instruction. As suggested in the previous chapter, since the task is the means of continued existence of an occupational group, special education teachers were likely to consider differentiation of instruction as the defining element in their work, and therefore guard it against intrusions from school administration or regular education teachers.

Job crafting (which reflects the adaptation processes used in the teaching practice of a teacher) may be a means for special education teachers to claim control over their work and occupational status in schools, where they are dominated numerically by regular education teachers. The numerical domination of regular education teachers over special education teachers is also accompanied by a general sense, at least among the special education teachers interviewed, that they occupy a lower status in the school

status hierarchy. This sense is fostered by a general lack of administrative or collegial support, resources, and understanding of the difficulty of the special education teachers' jobs.

Two competing forces describe the dynamics of the boundaries between the two occupational specialties. On the one hand, special education teachers try to establish their work autonomy by guarding their practice from general education teachers or school administration intrusions (such as efforts to standardize their teaching practice). On the other hand, teachers' need for belonging (Baumeister & Leary 1995) fostered by a sense of physical isolation in schools makes some teachers more willing to cross the boundaries and interact more frequently and closely to members of the other occupational group – the general education teachers. These two competing forces create an interesting dynamic to study in the current research context.

In sum, special education teachers used adaptation of instruction as means to establish their legitimacy in schools and enhance their marginal status. In the context of teaching mathematics – the focus of the larger study in which this research is conducted – the mathematics curriculum was considered the standard in the teaching process ("teaching math along reform lines") and organizational discourse in schools reinforced the idea that it was the sole legitimate means of teaching practice. However, this constituted the task domain of regular education teachers, who mastered the content knowledge. Thus, promoting teaching according to the curriculum supported the regular education teachers' jurisdiction over the teaching practice and their more central place in the occupational hierarchy.

In contrast, special education teachers' mastery was over knowledge that was perceived as much less abstract (how to adapt the teaching practice for different student needs) and somehow less complex, inferior ("any teacher knows how to do that and does it" – a special education teacher quoting the organizational discourse; observation notes). Special education teachers emphasized the importance of adapting and tailoring the teaching process, to enhance their legitimacy in schools. In my observation work, I noticed that special education teachers often showed how following the standards in the math curriculum (i.e., same exercises for all students, having students working in certain recommended groupings) did not work in their classes. Thus, they emphasized the need to differentiate practice and the

usefulness of their knowledge. One teacher whom I shadowed in my field visits described how she was pretending to use the standard exercises or grouping practices to show the administration that she followed the recommended practices regularly, when she was monitored by the school administration during class visits. However, the teacher shared with me that she actually wasn't doing that in her daily practice. Instead, she would use her own arrangements and exercises to facilitate instruction in the class. Similar insights were provided by several special education teachers shadowed during field visits.

In sum, special education teachers saw following the curriculum emphasized by the administration as not very relevant for all the day-to-day issues they encountered in their work. Because tailoring and adapting the teaching practice was more difficult to codify, more tacit and unclear to others not in the special education occupational group, it was used by special education teachers to establish and maintain their status as experts in adapting the instruction, and maintain occupational jurisdiction. Special education teachers considered this a skill that was not codified in the documents (curricula), but transmitted through their practice. In contrast, regular education teachers took this knowledge for granted and did not consider it an individual skill. Because differentiating was not included in curriculum to a large extent, its legitimacy was devalued.

6.1.2 Hypotheses

Given the context described in the previous section and following the propositions outlined in Chapter 3, I propose the following hypotheses:

> ***Hypothesis H1:*** *Discretion in work will be associated with higher levels of special education teachers' job crafting behaviors*
>
> ***Hypothesis H2:*** *Task complexity will be associated with higher levels of special education teachers' job crafting behaviors.*
>
> ***Hypothesis H3:*** *Task interdependence with others at work will be associated with lower levels of special education teachers' job crafting behaviors.*

Hypothesis H5: *The strength of the occupational community of practice of special education teachers will be associated with higher levels of teachers' job crafting behaviors.*

Hypothesis H6: *Special education teachers who engage in more job crafting will report higher levels of job satisfaction and organizational commitment.*

6.2 STUDY DESIGN

The second study examines individual job crafting behaviors in more detail, using a richer measure of job crafting. It also provides insights on different facets of the work context (in terms of structural and relational factors) influencing job crafting in this context. Thus, it provides opportunities for a better understanding of organizational level influences on job crafting behaviors. It also explores the role of occupational communities of practice in organizations on the job crafting of their members. As opposed to the first study that looks at job crafting in a for-profit setting in manufacturing, the second study examines job crafting in a not-for-profit setting, in service organizations.

The chosen design is a field study in which surveys were utilized to gather data on employee attitudes and behaviors. The surveys were complemented by exploratory qualitative work to better understand the nature of job crafting in this particular work setting. The survey part of the study was included in a larger survey of teachers, which was part of a multi-year study of the implementation of an innovative curriculum for teaching mathematics in a large urban public school district, conducted by Carrie Leana and Frits Pil. Job crafting was not the focus of the larger study, but only the focus of the current study presented in this dissertation. The year when the current study of special education teachers was conducted (2005) was the second year of the larger multi-year study; however, in the previous year, special education teachers were not included in the larger survey, such that they were for the first time surveyed for the current study of job crafting.

6.2.1 Procedures

Given that the data for this study were collected as part of the second year of the larger study of teachers described before, special survey administration procedures that were in place for the larger study were followed in the administration of the survey for the current study of special education teachers. The surveys were administered in the spring of 2005, with the data being collected and entered by a survey research institute that served as a third party ensuring participant confidentiality (Center for Survey Research, University of Massachusetts).

I surveyed all special education teachers in 200 elementary schools in the district. Surveys were distributed by a teacher representative trained by the researchers in survey distribution. The surveys were distributed to teachers during paid after-school time. For schools in two regions, the surveys could not be administered during the initially planned time, due to the fact that the school district cancelled after school professional development because of a snowstorm. Therefore, survey administration was rescheduled a few weeks later, during either an upcoming professional development session, or – for some schools – during group preparation periods, lunch, or via teacher mailboxes. Therefore, survey administration varied from school to school in the two regions under question.

The surveys (including both the general questions pertaining to the larger study and the questions developed by the author for this study of job crafting) took about 45 minutes to complete. After completion, the surveys were mailed directly to the third party for data entry, to ensure anonymity of individual teachers. Teaches received each a $10 gift card for their participation in the study.

Of the targeted 204 schools, 200 schools chose to participate for a school-level response rate of 98%. Of the 807 targeted special education teachers, 661 teachers returned usable surveys, representing a response rate of 82%. Using teachers' surveys, school information from teacher representatives in each school, and archival data, I developed a multi-level data set that enabled me to statistically model the variables across two levels of analysis: individual (i.e., 661 teachers) and organization (200 schools). The

study design allows thus to simultaneously explore the effects of individual and organizational level variables on individual job crafting.

I conducted observations of special education teachers working in classrooms in several schools in the district under study. Observations allowed me to develop a better understanding of the work context and the nature of the work of special education teachers. The teachers in the study worked in two distinct types of work organization, as described earlier – (1) team teaching (called here "collaborative") and (2) self-contained teaching (called here "stand-alone"). Collaborative teachers worked in dyads in the classroom, each paired with one regular education teacher. The two teachers in a collaborative classroom delivered instruction together for both special and regular education students. Stand-alone teachers worked alone in the classroom, delivering instruction only to special education students. In addition to observations, I conducted several unstructured interviews with special education teachers in both types of work organization, as well as with school administrators and special education professionals in the district.

Additional data regarding the school and the general and special education instruction in the school was collected from the survey administrators (mathematics coaches or teacher representatives) for each school, as part of a survey administered to them in the larger research study. Survey administrators filled out the surveys at their convenience and were compensated for their time spent doing that.

6.2.2 Measures

Some of the measures used in this study were adapted from previous empirical studies in organizational research. However, some of the measures were created specifically for this context to capture more closely the context of work. More specifically, the job crafting measure was created after several observation sessions of work practice in special education classes, and interviews with special education teachers, special education professionals in the regional district office, and special education administration at the region level. I followed these observations and interviews with a focus group discussion with special education professionals at the United Federation of Teachers in the school district

under observation. In cases where there were multi-item indices, I created each index by averaging the ratings over the items that comprised that measure. Factor analysis and scale reliability analyses are presented in the next sections of this chapter. The items used in the survey are indicated in Appendix B, together with the source of each scale.

Discretion. To measure discretion, I followed previous research indicating that discretion and control over work are important to the extent that they are *perceived* by the actor (Ganster & Fusilier, 1989; Ashforth & Saks, 2000). Perceived discretion was measured with a scale consisting of six items, which we adapted from Jehn's (1995) task type scale. The response format used was a 5-point Likert-type scale with anchors 1="strongly disagree" and 5="strongly agree". The scale was shortened and adapted to capture the extent to which teachers have freedom to experiment with new methods and materials and change the teaching approach, and have autonomy to solve teaching-related problems. Scale reliabilities are presented later in this chapter.

Task complexity. To measure task complexity, I created an index that includes the following empirical measures: teaching more than one grade, teaching students with multiple disabilities, and number of different disability conditions in class. According to the insights gained in the interviews and focus group discussions, a special education teacher's job was more complex as the number of grades taught increased. Teachers having to teach two or more grades in the same class encountered increased task complexity as they had to master the content knowledge of more than one grade and teach different lessons simultaneously to students in different grade-levels. Further, having a student with multiple disabilities was thought of as an increase in task complexity, as the different disabilities might interact to increase the complexity of teaching. Finally, the more disability conditions teachers have in their class, the more complex their tasks. Discussions with special education professionals revealed that the various types of disability conditions could not be ranked clearly according to a complexity level, therefore I did not include in the task complexity index a rating of the complexity associated with each type of disability. The creation of the task complexity index is detailed later in this chapter.

Interdependence. I measured interdependence with a three-item scale developed by Campion, Medsker and Higgs (1993). The measure was adapted to capture the extent to which teachers depend ed on other teachers in the school and other teachers depend ed on them for information and teaching materials, as well as the extent to which teachers' jobs were related to one another. The response format used was based on a 5-point Likert-type scale, with anchors 1="strongly disagree" and 5="strongly agree".

Occupational community of practice. I measured occupational community of practice by the level of agreement among special education teachers on teaching values, beliefs and approaches. Beliefs about teaching were measured using 15 items developed by Ross et al. (2003). The creation of the occupational community of practice measure is detailed later in the chapter.

Job crafting. Following Wrzesniewski and Dutton (2001), I measured three facets of job crafting – task, relational, and cognitive crafting. I developed a rich and contextualized measure of job crafting that incorporates (1) the specific task tailoring and expanding behaviors that teachers used to adapt their teaching and make a positive difference for their students, as well as (2) the relationships teachers enacted with others in the workplace to get their work done more effectively, and (3) the extent to which teachers ascribed increased meaningfulness and significance to their work.

Task crafting. I conducted qualitative work to develop a rich measure of task crafting. Through a focus group, I developed and refined 17 items capturing various task tailoring and expanding behaviors used by teachers in their work practice. The response format captured the frequency of using these behaviors and was based on a 5-point Likert-type scale, with anchors 1="never", 2="rarely", 3="sometimes", 4="most of the time", and 5="for all sessions". A detailed analysis of this measure is presented later in this chapter.

Relational crafting. I asked teachers to report on their interactions with other relevant employee groups at work (other teachers at grade level, other teachers not at grade level, administrators, special education teachers, other people in school, and other people outside school). Using these reports, I created the relational crafting measure as an index of two components: (1) relational range and (2) relational strength. Later in this chapter I detail the creation of the relational crafting index.

Cognitive crafting. I followed Wrzesniewski & Dutton's (2001) suggestions and measured cognitive crafting as the extent to which teachers ascribed increased meaning and significance to their work. For this, I adapted Hackman and Oldham's (1980) three-item job significance scale. The response format used was based on a 7-point Likert-type scale for two items (with anchors 1="very inaccurate" and 7="very accurate") and on a variation of this format for the third item (with anchors 1="not at all significant" and 7="very significant").

Job satisfaction was measured with three items capturing the level of personal gratification teachers felt from doing their jobs, as well as their satisfaction with immediate co-workers and the job overall. The response format was based on a 5-point Likert-type scale, with anchors 1="very dissatisfied" and 5="very satisfied".

Organizational commitment was measured with a four-item scale developed by Bryk and Schneider (2002), which was targeted at teachers' specific work context. The items measured the extent to which teachers would recommend their school to parents seeking a place for their child, would not want to work in other school than their current school, and felt loyal to their school. The response format was based on a 5-point Likert-type scale, with anchors 1="strongly disagree" and 5="strongly agree".

Control Variables. I controlled for several variables at the individual and organizational level of analysis. At the individual level, I first controlled for teachers' levels of experience on the job, which can influence their job crafting. I measured experience by asking teachers to report on the number of years they spent in the teaching profession. I also included as control variable teachers' skills, because highly skilled teachers may be more able to introduce new work approaches or develop broader networks of relationships with others. I measured skills using a set of 12 items selected from the University of Michigan teacher testing items and calculating the total number of items that each teacher answered correctly.

I also factored into the analysis whether the students taught by teachers were at grade levels that were subject to standardized testing. Standardized testing may influence teachers' practice because teachers may change their teaching approach specifically for improving students' performance on the

tests. Since students in grades 3rd to 5th were tested, whereas students in kindergarten and 1st and 2nd grades were not, we included as control a dichotomous variable indicating whether the teacher taught at grades kindergarten to 2nd versus grades 3rd to 5th.

Because teachers in the study worked in two different types of work organization (collaborative or stand-alone), I controlled for this fact by using a dichotomous variable indicating whether a teacher worked in one of these two types of arrangements. Work organization can affect teachers' levels of crafting, since it influences their level of independence on the job.

I also controlled for class size, which was coded as a dichotomous variable, to account for the two most typical class sizes (small class - around 12 students; and large class - around 25 students). After inspecting the distribution of class size, the variable class size was recoded as 0 for 15 or fewer students in a class, and 1 for more than 15 students in a class.

Finally, I controlled for teachers' levels of professional identification with the special education profession. The literature indicates that employees who more strongly identify with their occupation are likely to adhere more strongly to the values of their occupation (Lui, et al., 2003). When individuals identify more strongly with their profession, they are more likely to act independently and in the best interest of the beneficiaries of their work – their patients, customers, or, in the case of teachers, their students. Miner and colleagues (Miner, 1993; Miner et al., 1994) assert that individuals who identify more intensely with their profession feel more personally responsible to the beneficiaries of their work. As a result, they will more likely engage in independent action based on their own best professional judgment to achieve their beneficiaries' best interests. Further, professional identification fosters helping behaviors because the relationship professional-beneficiary is central to the work practice of the professional (Lui, et al., 2003). Finally, James (1997) contends that professional identification positively influences public service values – such as caring for others, social justice, or helping others to learn – and the motivation to serve others. Therefore, individuals who identify more with their profession are more likely to engage in behaviors consistent with helping others and contributing to the public good. As a consequence, these

individuals will be more likely to craft their jobs to enhance their work practice and achieve the best interests for their beneficiaries.

I measured professional identification with a three-item scale developed by Elsbach & Bhattacharya (2001). I adapted the original scale to capture the extent to which teachers identified with the special education profession. The response format used was based on a 5-point Likert-type scale, with anchors 1="strongly disagree" and 5="strongly agree".

At the organization level, I controlled for school size, number of special education teachers in the school, school socio-economic status (SES), school turnover in the previous year, and overall level of agreement among all teachers on teaching values and beliefs. I reasoned that larger schools may have more bureaucratic structures in place and place more constraints on what teachers do in their classrooms. School size was measured as the total number of teachers in the school, as reported by the teacher representative. I also controlled for the number of special education teachers in the school (reported by the teacher representative), because it may affect the level of information sharing among them.

I controlled for school SES because schools whose student bodies are comprised of children of lower socio-economic status are generally viewed as more challenging work environments and thus can affect teacher performance. I followed convention in the educational literature and factored into the analyses the percentage of the student body eligible for free or reduced-cost lunches. Lunches are free or subsidized by the federal government when a student's family income falls below a minimal level. Information on the economic status of the student population in each school was obtained from annual school reports from the district. I also controlled for school turnover in the school year prior to survey administration, because it may be an indicator of teachers' overall level of satisfaction with and engagement in their work. Turnover was measured by calculating the ratio of teachers who left the school at the end of the previous school year to the total number of teachers in the school. Finally, the overall level of agreement among all teachers in the school on teaching values and beliefs may influence special education teachers' approaches to work. Therefore, I also controlled for the overall school agreement on teaching values and beliefs. The creation of this measure is detailed later in this chapter.

6.2.3 Analysis of the Task Crafting Measure

In the construction of the task crafting measure, the focus group discussions led to the hypothesis that task crafting had two distinct components. The first component was tailoring (or customizing) tasks and the second component was expanding tasks. These two components of task crafting capture two distinct aspects of crafting. "Tailor" captures what special education teachers may do when they modify their teaching practice to meet the needs of the students in their class, in ways that are not specified by their job. Teachers reported in interviews that they tailored their tasks based on their own work experience and students' needs and learning styles. Several teachers reported in interviews that they preferred some tailoring behaviors to others or avoided some tailoring behaviors that others teachers used. For example, one teacher reported that she did not use flexible grouping in her class, because it did not work with her students, although other teachers she knew used this type of grouping. Interviews with several teachers indicated that these behaviors are at the latitude of each teacher. Teachers may decide to use none, some, or all of these behaviors, as frequently as they consider appropriate. According to the teachers interviewed, the individualized education plans established for each student with special needs (i.e., the IEP documents) state the level at which teachers need to instruct their students, but do not state how to modify instruction to achieve this goal.

"Expand" captures what special education teachers may do to supplement or expand the boundaries of their tasks. Expand captures what teachers consider doing beyond tailoring to meet the needs of each individual student in their class. For example, one teacher reported that when teaching mathematics, she "put everything in a story to create practical lessons for life", such as using money as an example for students to learn. Interestingly, she indicated that another special education teacher gave her this tip, while attending classes together. Another teacher reported in the interview that she sometimes used songs that she created herself, to connect a teaching point or remind students something they learned before. Another special education teacher reported that she sometimes went around the classroom and taught the lesson at each individual table where students were seated. A teacher indicated that in her

mathematics class, she created three student groups and rotated them across three tables, where they learned a different strategy for multiplication, arguing that not all students learn using one strategy. Finally, in another interview, a special education teacher reported that she stayed late and helped students with poor organizing skills to organize before leaving the school. These examples show the variety of behaviors, outside job boundaries, that some special education teachers use to craft their jobs and achieve their work goals.

6.2.4 Measurement Model Evaluation

In order to test the measurement model for the task crafting measure, I conducted first a confirmatory factor analysis (CFA) on half of the sample. This analysis was followed by a CFA on the other half of the sample. More specifically, to conduct these analyses, I divided the full teacher sample in two halves. I then ran a CFA on the first half of the sample and cross-validated the model on the second half of the sample.

The CFA was conducted in LISREL 8.7, using ML (Maximum Likelihood) as method of estimation. As indicated previously, in the construction of the 17 items for task crafting (Table 18), I hypothesized that crafting had two components – task tailoring (items q_{37a} - q_{37l}) and task expanding (items q_{38a} – q_{38e}). Task tailoring (or customizing) captures behaviors through which teachers tailor their tasks to the specific needs of their students, in ways that are not specified by the teachers' job. Task expanding captures behaviors through which teachers introduce new approaches to their work to get it done. Given the theorized dimensions, I ran the CFA requesting a two-factor solution. Factor loadings from the two-factor solution performed using principal component analysis with varimax rotation are presented in Table 19. The criterion used for retaining a factor was that the corresponding Eigenvalue exceeded the value of 1.

Table 18 Items Developed for the Measurement of Task Crafting

Task crafting items
I. Task tailoring (customizing)
Q_{37a} Teach concepts in small steps that are more manageable for some students
Q_{37b} Provide shorter problems or fewer assignments for some students
Q_{37c} Allow extra time for students to complete tasks
Q_{37d} Use a highlight marker to identify key words for some students
Q_{37e} Tape record materials or tests for some students
Q_{37f} Focus more on organizational skills with some students
Q_{37g} Assign a classmate as a learning buddy to some students
Q_{37h} Use flexible grouping to meet individual students needs
Q_{37i} Use more than one type of homework in the same math class
Q_{37j} Have different performance expectations for students in the same math class
Q_{37k} Use alternate multi-sensory means to teach a concept to some students
Q_{37l} Use supplemental/different curriculum materials to individualize math instruction for some students
II. Task expanding
Q_{38a} Share your own mental processes that you use to solve math problems with students
Q_{38b} Use your own math games for students
Q_{38c} Use songs you wrote to help students recall math facts
Q_{38d} Use math resources you found on the internet
Q_{38e} Use math materials you purchased with your own money

Table 19 Confirmatory Factor Analysis for the Task Crafting Measure
(Initial Model, 17 items)

Item	***Orthogonal rotation (Varimax-rotated factor loadings)***		***Decision***
	F1	***F2***	
Q_{37a} Teach concepts in small steps that are more manageable for some students	**0.580**	0.064	***retained***
Q_{37b} Provide shorter problems or fewer assignments for some students	**0.572**	0.164	***retained***
Q_{37c} Allow extra time for students to complete tasks	**0.613**	0.035	***retained***
Q_{37d} Use a highlight marker to identify key words for some students	0.368	0.368	*dropped*
Q_{37e} Tape record materials or tests for some students	0.230	**0.424**	*dropped*
Q_{37f} Focus more on organizational skills with some students	**0.482**	0.272	***retained***
Q_{37g} Assign a classmate as a learning buddy to some students	**0.437**	0.133	***retained***
Q_{37h} Use flexible grouping to meet individual students needs	**0.560**	0.154	***retained***
Q_{37i} Use more than one type of homework in the same math class	**0.419**	0.188	***retained***
Q_{37j} Have different performance expectations for students in the same math class	**0.530**	0.078	***retained***
Q_{37k} Use alternate multi-sensory means to teach a concept to some students	**0.575**	0.319	***retained***
Q_{37l} Use supplemental/different curriculum materials to individualize math instruction for some students	**0.543**	**0.454**	*dropped*
Q_{38a} Share your own mental processes that you use to solve math problems with students	0.287	0.081	*dropped*
Q_{38b} Use your own math games for students	0.106	**0.660**	***retained***
Q_{38c} Use songs you wrote to help students recall math facts	0.101	**0.575**	***retained***
Q_{38d} Use math resources you found on the internet	0.099	**0.616**	***retained***
Q_{38e} Use math materials you purchased with your own money	0.140	**0.581**	***retained***

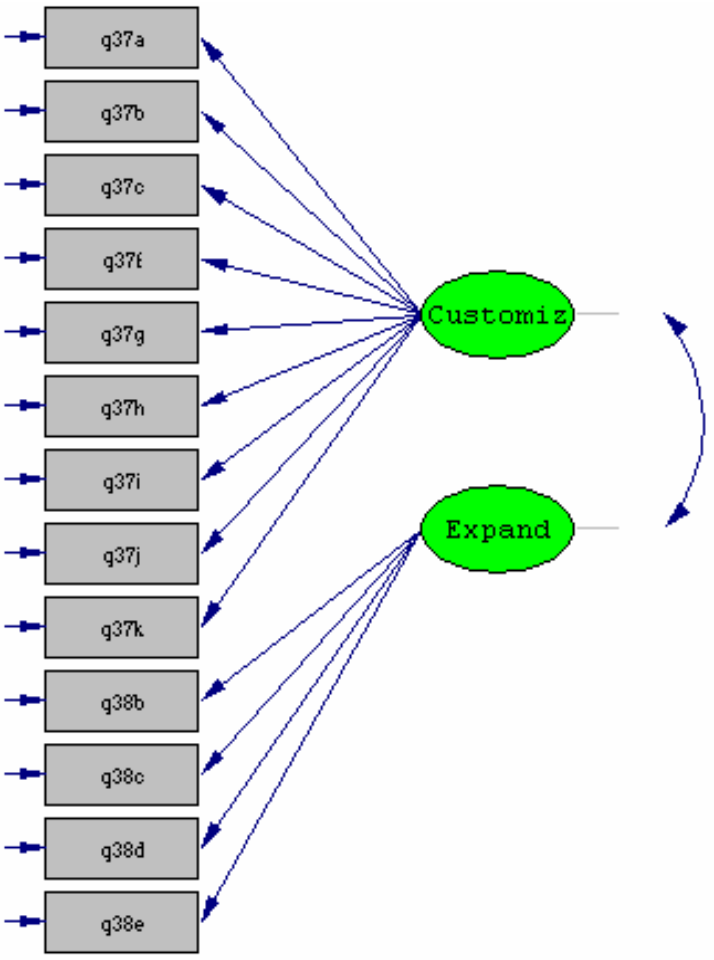
Previous literature suggested a threshold level for the factor loadings of 0.40 (Gorsuch, 1983). Examination of the factor loadings revealed that two items (q_{37d} and q_{38a}) did not load above the threshold level on either factor. Therefore, these items were dropped. Further, item q_{37e} loaded on the other factor than the one expected. Further, tests of the univariate normality of the task crafting items indicated extreme skewness (31.32, $p<0.01$) and kurtosis (55.77, $p<0.01$) indexes for item q_{37e} (cf. Kline, 1998). Previous literature indicates few clear guidelines about how much non-normality is problematic (Kline, 1998). However, the literature suggests that data sets with absolute values of univariate skew indexes greater than 3.0 and kurtosis indexes greater than 10.0 indicate a serious problem. For these reasons, item q_{37e} was dropped. Further, item q_{37l} cross-loaded on both factors and therefore was dropped. After dropping the four items mentioned above, the remaining 13 items loaded on the expected factors, confirming the two-factor solution. Analysis of this respecified two-factor measurement model with 13 items (Figure 5) revealed that the model provided a good fit to the data ($\chi^2=1198.58$, $p<0.001$; CFI=0.94, RMSEA=0.070). Although the χ^2 is significant, each of the other indices indicates acceptable fit of the model. The value of the chi-squared per degrees of freedom ($\chi^2/df=18.72$) is larger than the recommended threshold of 3.0 (Kline, 1998). However, the value of the root mean square error of approximation (RMSEA) is smaller than the upper limit threshold for acceptable fit (0.08), indicating an adequate fit of the model.

Assessment of Convergent and Discriminant Validity. In order to assess the convergent validity of the measurement model, I followed Anderson and Gerbing (1988), who suggested that convergent validity is achieved when each indicator's estimated loading on its posited underlying construct factor is significant. All the loadings λ are significant ($p<0.01$), suggesting that the measurement model has convergent validity. Further, the estimated factor correlation ($\Phi_{12}=0.45$) is only moderate in size, which suggests that discriminant validity is achieved (according to Kline, 1998). Discriminant validity can be assessed for two estimated constructs by constraining the estimated correlation parameter between them to 1 and then performing a chi-square difference test on the values obtained for the constrained and unconstrained models (Joreskog, 1971; Anderson & Gerbing, 1988). A significant lower chi-square value

for the model in which the factor correlations are not constrained to unity would indicate that the factors are not perfectly correlated and that discriminant validity is achieved (Bagozzi & Phillips, 1982). The constrained measurement model for assessing discriminant validity is presented in Figure 6. The unconstrained model has a significantly lower chi-square value and thus indicates that the two factors (Tailor/Customize and Expand) are not perfectly correlated and discriminant validity is achieved (cf. Bagozzi & Phillips, 1982).

Cross-validation of the measurement model. Anderson and Gerbing (1988) and Cudeck and Browne (1983) recommend that measurement models should be developed to perform optimally in future samples. Therefore, measurement models should be cross-validated by testing them on a different sample from the one on which they were developed. Following these recommendations, I performed a cross-validation analysis on the second half of the sample (Figure 7). The model achieves good fit on the other half of the sample (χ^2=1253.28, p<0.001; CFI=0.94, RMSEA=0.074).

Item	Loading λ
q_{37a}	0.58**
q_{37b}	0.60**
q_{37c}	0.59**
q_{37f}	0.54**
q_{37g}	0.47**
q_{37h}	0.59**
q_{37i}	0.46**
q_{37j}	0.52**
q_{37k}	0.61**
q_{38b}	0.68**
q_{38c}	0.57**
q_{38d}	0.64**
q_{38e}	0.64**



Φ_{12}=0.45

** p<.0.01

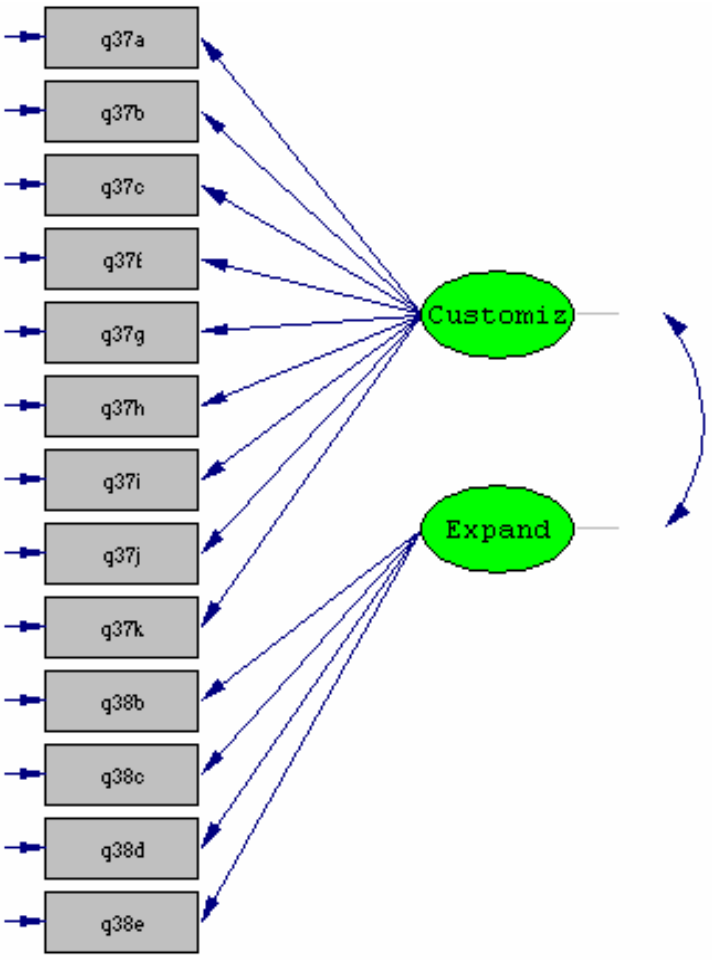
χ^2=1198.58, df=64, p<0.001, RMSEA=0.070

$$\frac{\chi^2}{df} = 18.72 > 3$$

RMSEA < 0.08, p<0.01; 90% CI for RMSEA=(0.066; 0.074)
NFI=0.94; NNFI=0.93; CFI=0.94; GFI=0.94

Figure 5 Confirmatory Factor Analysis for the Task Crafting Measure
(Model respecified, 13 items)

Item	Loading λ
q_{37a}	0.55**
q_{37b}	0.58**
q_{37c}	0.55**
q_{37f}	0.55**
q_{37g}	0.46**
q_{37h}	0.58**
q_{37i}	0.46**
q_{37j}	0.50**
q_{37k}	0.63**
q_{38b}	0.39**
q_{38c}	0.36**
q_{38d}	0.38**
q_{38e}	0.40**



** p<.0.01

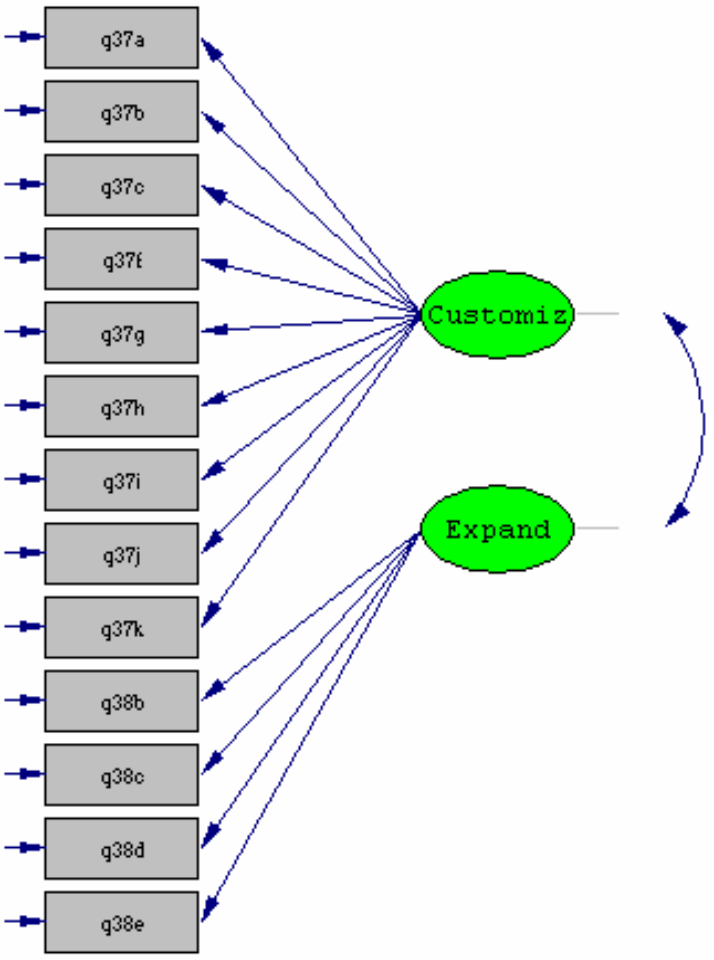
χ^2=3204.83, df=65, p<0.001, RMSEA=0.116

Model	**χ^2**	**df**	**$\Delta\chi^2$**	**$\Delta\chi^2$ df**	**CFI**	**NNFI**	**RMSEA**
Unconstrained model	1198.58***	64	-	-	0.94	0.93	0.070
Constrained model	3204.83***	65	2006.25	1	0.84	0.81	0.116

*** p<0.001

Figure 6 Constrained Measurement Model for Task Crafting

Item	Loading λ
q_{37a}	0.60**
q_{37b}	0.62**
q_{37c}	0.61**
q_{37f}	0.50**
q_{37g}	0.47**
q_{37h}	0.62**
q_{37i}	0.47**
q_{37j}	0.55**
q_{37k}	0.62**
q_{38b}	0.69**
q_{38c}	0.53**
q_{38d}	0.65**
q_{38e}	0.65**



Φ_{12}=0.48

** p<.0.01

χ^2=1253.28, df=64, p<0.001, RMSEA=0.074

$$\frac{\chi^2}{df} = 19.58 > 3$$

RMSEA < 0.08, p<0.01; 90% CI for RMSEA=(0.070; 0.078)
NFI=0.94; NNFI=0.93; CFI=0.94; GFI=0.94

Figure 7 Cross-validation of the Task Crafting Measurement Model

In sum, the task crafting measure obtained consisted of 13 items, with two factors – tailor (9 items) and expand (4 items). Figure 8 summarizes the process undertaken for the measurement model evaluation.

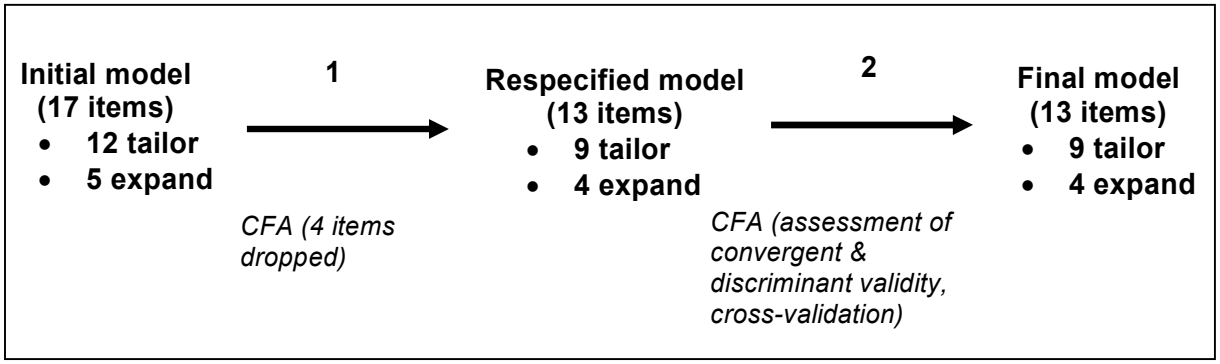


Figure 8 Summary of Measurement Model Evaluation Process

One last issue regarding the task crafting measure was the possible concern that too many special education teachers engaged in high levels of the behaviors captured by task crafting. Analyses indicated, however, that although many of the teachers in the study engaged to some extent in the task crafting behaviors measured in this study (M=3.12, s.d.=0.52 for collaborative teachers; M=3.26, s.d.=0.47 for stand-alone teachers), overall only a small percentage of teachers engaged in these behaviors most of the time or for all class sessions (5% of collaborative teachers; and 6% of stand-alone teachers). This suggests that although a small percentage of teachers used task crafting most of the time or for all sessions, on average teachers used task crafting only sometimes during their teaching practice[1]. Thus, the analyses of the data reinforce the field interviews, observations, and focus group insights in that the behaviors examined are job crafting and not something that teachers consider routine part of their job. These

[1] An alternative solution to this issue was to run analyses using deviation scores instead of raw scores for task crafting. Deviation scores measure how much each individual scored relative to the overall mean value of task crafting. I created deviation scores by subtracting the mean value from each individual's raw scores on task crafting. Separate analyses were run using deviation scores instead of raw scores. The results of these analyses indicated no significant differences from the results of the analyses run using raw scores, and therefore are not presented here.

findings confirm the interview findings that the individualized education plan developed for each student, while stating the general level at which special education teachers need to instruct students, does not specify the specific means to be used or how to achieve this goal, and thus leaves at the teachers' latitude how to change their practice in each case.

6.2.5 Scale Reliability Analysis

The scale reliabilities for the measures used in the present study are presented in Table 20. The Cronbach's alpha of each of the scales was above the .70 threshold recommended by Nunnally (1978), except the one for cognitive crafting. The cognitive crafting scale was adapted from Hackman & Oldham (1975), who reported a reliability coefficient of .66. Several researchers have pointed out that a difficulty involved in using Hackman and Oldham (1980)'s scales is their low internal consistency. In a meta-analysis of the psychometric properties of the scales, Taber and Taylor (1990) found an average internal consistency of 0.65 for the original scale that was adapted for this study. They suggested that one of the major reasons for these low reliability coefficients was the use of three different formats for the three items in the Hackman and Oldham's scales – one item uses a typical Likert scale, one item uses a negatively-worded Likert scale, and the third item uses a different format (the so-called three-anchor format). In support of this idea, several scholars found that the measurement model that provided a good fit for the full job diagnostic survey included two additional factors – one associated with the negatively-worded items and one associated with the three-anchor items (Harvey, Billings, & Nilan, 1985; Idaszak & Drasgow, 1987; Kulik, Oldham, & Langner, 1988). Finally, some researchers recommend addressing the problem of low to moderate internal consistency by augmenting each scale with a fourth positive item (Kulik et al., 1988; Taber & Taylor, 1990). However, despite the low internal consistency of the scales, Taber and Taylor report that discrimination among the scales is not a serious problem when using Hackman and Oldham's scales.

I changed the three-anchor item to a Likert scale, but kept the negatively-worded item. An additional analysis to improve reliability by deleting items would have reduced the scale to two items,

with a marginal increase in alpha, which was still below the 0.70 threshold. Therefore, no modifications were made to the cognitive crafting scale. Given the low value of the reliability coefficient for this scale, results regarding the cognitive crafting component of job crafting should be interpreted with caution.

The final scores for all the multiple-item variables were created by averaging the item scores of all the items retained in each measure.

Table 20 Summary Results of Scale Reliability Analyses

Scale	***Number of Items***	***Reliability Estimate (Cronbach's alpha)***
Individual level variables		
Task crafting	13	0.79
Customize	9	0.80
Expand	4	0.71
Cognitive crafting	3	0.43
Task interdependence	3	0.71
Discretion	6	0.79
Job satisfaction	3	0.74
Organizational commitment	4	0.87
Organizational level variables		
Occupational community of practice (special education)	15	0.71
Overall agreement on beliefs about teaching (school)	15	0.71

6.2.6 Computation of Additional Variables

Three of the variables in the study were computed from several empirical measures. First, task complexity was created as an index that includes the following empirical measures: teaching more than one grade, teaching students with multiple disabilities, and number of different disability conditions in class. According to the insights gained in the interviews and focus group discussions, a special education teacher's job was more complex as the number of grades taught increased. Teachers having to teach two or more grades in the same class encountered increased task complexity as they had to master the content

knowledge of more than one grade and teach different lessons simultaneously to students in different grade-levels. Further, having a student with multiple disabilities was thought of as an increase in task complexity, as the different disabilities might interact to increase the complexity of teaching. Finally, the more disability conditions teachers have in their class, the more complex their tasks. Discussions with special education professionals revealed that the various types of disability conditions could not be ranked clearly according to a complexity level, therefore I did not include in the task complexity index a rating of the complexity associated with each type of disability.

Table 21 shows the means, standard deviations, and inter-correlation coefficients of the task complexity index components. 55% of special education teachers taught more than one grade level in their classrooms, 72% taught students with multiple disabilities, and the mean number of disability conditions per classroom was 3.37. The three components of task complexity were positively correlated, with teaching students with multiple disabilities being significantly correlated with both teaching more than one grade ($r=0.116$, $p<0.01$) and number of different disability conditions in class ($r=0.269$, $p<0.01$). The disability conditions that teachers reported they had in their classrooms ranged from learning disability (93.8% of teachers reporting they had students with this type of disability) to traumatic brain injuries (4.7% of teachers reporting they had students with this type of disability; see Table 22).

I created an index of task complexity by calculating the standardized scores for the three empirical measures indicated above and summing these standardized values to create an additive index:

Task Complexity Index = *Standardized Value* (Teach more than one grade) + *Standardized Value* (Students with multiple disabilities) + *Standardized Value* (Number of disability conditions in class).

Table 21 Means, Standard Deviations, and Inter-correlations of Task Complexity Index Components

Component	*M*	*SD*	*Teach more than one grade*	*Teach students with multiple disabilities*
Teach more than one grade	0.55	0.50		
Teach students with multiple disabilities	0.72	0.45	0.116**	
Number of different disability conditions in class	3.37	1.43	0.078	0.269**

* p<0.05, ** p<0.01

Table 22 Types of Disability Conditions

Disability type	*% of teachers reporting having this condition in classroom*
Learning disability	93.8%
Speech or language impairment	87.7%
Emotional disturbance	63.0%
Mental retardation	28.1%
Autism	23.2%
Hearing impairment	14.4%
Orthopedic impairment	11.5%
Visual impairment	10.1%
Traumatic brain injury	4.7%

Second, relational crafting was created as an index of two components: (1) relational range and (2) relational strength. I followed the method described by Smith, Collins, and Clark (2005) to create an index of interaction with others. Relational range was measured following Smith and colleagues (2005) and Burt & Minor (1983), who created a measure of network range that captures the breadth of knowledge mobilized through an individual's interactions with others. Thus, range was defined as the proportion of categories of relevant others in an individual's network to whom the individual had at least

one link. Given that the range items measured whether an individual had interactions with each of six relevant categories of others (other teachers at grade level, other teachers not at grade level, administrators, special education teachers, other people in school, and other people outside school), the range measure was calculated as the percentage of groups with whom a teacher interacted out of the total number of six possible groups with whom a teacher could interact. The range variable takes values between 0 (no interaction with others) and 1 (interactions with each of the six groups). Following Smith and colleagues (2005), I created the measure of relational strength by calculating the mean frequency of interaction across all categories with whom a teacher interacted in an average month. The frequency of interaction measures were continuous variables. After inspecting the distributions of the frequency measures, I recoded these variables on a 1 (very low frequency) to 5 (very high frequency) scale to take care of skewness of the data. For illustration, the skewness coefficients for the frequency of interaction measures before and after the recoding are shown in Table 23. The original frequency measures were highly skewed (skewness coefficient above 2.0) and the recoded measures show a low skewness coefficient (below 0.5). Thus, the recoded relational strength variable takes values between 1 and 5.

Table 23 Skewness Coefficients for the Frequency of Interaction Measures Before and After Recoding

Measure	***Skewness before recoding***	***Skewness after recoding***
Frequency of interaction with teachers at grade level	2.54	-.36
Frequency of interaction with teachers not at grade level	3.69	-.07
Frequency of interaction with administrators	2.81	.37
Frequency of interaction with special education teachers	3.99	-.23
Frequency of interaction with other people at school	4.55	-.05
Frequency of interaction with other people outside school	2.45	-.05

The range and strength of interaction were significantly and positively correlated ($r=.10$, $p<.05$), thus justifying the creation of a global relational crafting measure. I created a global index of relational crafting by adding the standardized values of the range and strength variables:

Relational Crafting Index = *Standardized Value* (Range) + *Standardized Value* (Strength).

Third, I created the measures of occupational community of practice of special education teachers and overall agreement on beliefs about teaching in the school, by using a survey measure of beliefs about teaching. Beliefs about teaching were measured using 15 items developed by Ross, McDougall, Hogaboam-Gray, & LeSage (2003). The agreement on beliefs measure was calculated as the inverse of the diversity in beliefs, or the mean over the standard deviation of beliefs across all teachers in a school. Thus, for each school, I created: (1) a measure of agreement on beliefs among all teachers in the school, and (2) a measure of agreement on beliefs among all special education teachers in the school, for those schools with at least two special education teachers (as a measure of the occupational community of practice of special education teachers in the school).

7.0 RESULTS OF STUDY 2

This chapter presents the results of the statistical analyses for Study 2 of the dissertation. I begin with a report of the summary statistics and the zero-order correlations of the variables of interest in the study. Next, I review and summarize the results of the hierarchical linear modeling analyses conducted to test the hypotheses.

7.1 SUMMARY STATISTICS AND CORRELATIONS

The means, standard deviations, and zero-order correlations for the study variables are presented in Table 24. For variables coded as categorical, Table 25 indicates the break-down of data by category.

As described in Chapter 4, the special education teachers included in the present study worked in various work arrangements that may have affected the nature and level of their job crafting. Table 26 presents a break-down of teachers according to the various types of work organization provided by their schools. The two major categories of work organization found (and described in the methods chapter) are (1) teachers in "stand-alone" arrangements, and (2) teachers in "collaborative" arrangements. Table 26 25b indicates the number and proportion of teachers in each category of special education. There were 456 stand-alone teachers (or 70.8%) and 170 collaborative teachers (or 26.4%). A small number of teachers (18 teachers, representing 2.8% of the sample) identified as being in other positions, such as support services teachers (SETSS), individualized education plan teachers (IEP), and other. These 18 teachers were dropped from subsequent analyses. The reason for dropping these teachers was that there

were significant differences in the content of their jobs from a "typical" special education teacher 's job, yet their small number precluded any meaningful analysis to be performed on their group[2].

Examination of the correlations between the control variables and the other variables in the study revealed that older teachers were more likely to encounter more task complexity in their work ($r=.11$, $p<.01$) and less likely to perceive their jobs as significant and meaningful ($r=-.10$, $p<.05$). Older workers identified less strongly with the special education profession ($r=-.08$, $p<.05$) and were also more likely to exhibit stronger organizational commitment ($r=.13$. $p<.01$). Age was also significantly and highly correlated with experience ($r=.67$, $p<.01$). There was no conceptual reason to believe that age had a relationship with job crafting, whereas work experience was expected to influence teachers' perspectives and conceptions about how to approach their work. For these reasons, I dropped age from the all the subsequent analyses.

Gender was significantly and negatively correlated with cognitive crafting ($r=-.10$, $p<.05$) and significantly and positively correlated with relational crafting ($r=.09$. $p<.05$), suggesting that on average male teachers tended to engage in less cognitive crafting and more relational crafting. Gender was also significantly and negatively correlated with experience ($r=-.10$, $p<.05$), with male teachers tending to

[2] Field observations and interviews with teachers and administrators indicated, for example, that IEP teachers had much more flexible positions in schools than the other special education teachers. They typically spent their time conducting meetings for the initial reviewing and creating the individualized education plan (IEP) of students with special needs. These meetings typically included discussions with other special education teachers, the principal, parents, and other service providers for special education in the school, such as school psychologists, speech therapists, hearing counselors, social workers, occupational therapists and physical therapists. The rest of the time, they might have partial case loads, focus on prevention and intervention for students at risk, or work in a collaborative class to release the other teachers, when the need arises. Therefore, the job of an IEP teacher included less contact with students in a class setting and more one-on-one interaction with students and meetings with other special education teachers, parents, principals, and other service providers in the school. Similarly, interviews indicated that the job of support services teachers (SETSS) was significantly different from that of a "typical" special education teacher. These teachers typically pull out students with special needs from a regular classroom and worked with them in a separate setting for short sessions each day. They worked with smaller groups of students (typically not more than 8 students at a time) and their tasks were always coordinated with the teacher who taught the main class for those students. For these reasons, only teachers in the stand-alone and collaborative arrangements were included in the analyses.

have less work experience. Preliminary analyses showed that gender did not have a significant effect on the variables of interest in the study, and therefore was dropped from all the subsequent analyses.

Individual skills were significantly correlated with grade level (r=.11, p<.01), class size (r=13, p<.01), and work organization (r=-.12, p<.01), suggesting that more skilled teachers were more likely to teach grade levels that were subject to standardized testing, larger classes, and work in collaborative work arrangements. Further, skills were also significantly and negatively correlated with task complexity (r= -.12, p<.01), and positively correlated with cognitive crafting (r=.13, p<.01), relational cra fting (r=.10, p<.05. These suggest that highly skilled teachers tended to encounter tasks with lower complexity levels and exhibit higher levels of cognitive and relational crafting.

In addition, experience levels were significantly and positively correlated with task crafting (r=.11, p<.01) and negatively correlated with cognitive crafting (r= -.09, p<.05), suggesting that teachers with more experience were more likely to engage in more task crafting and less likely to engage in cognitive crafting. Experience was also significantly correlated with organizational commitment (r=.14, p<.01), with more experienced teachers being more likely to be more committed to their schools. Training was not significantly correlated with any of the other variables. Preliminary analyses indicated that training did not significantly influence any of the variables of interest in the study, therefore it was dropped from further analyses.

Teachers who taught grade levels that were subject to standardized testing tended to teach smaller classes (r=-.13, p<.01) and tended to have no paraprofessional in their classes (r=-.21, p<.01). They were also more likely to teach in stand-alone work arrangements (r=.12, p<.01) and work in more complex task environments (r-.08, p<.05). Regarding class size, teachers who taught larger classes were more likely to work in collaborative arrangements (r=-.94, p<.01). The strong correlation coefficient confirms the findings from the interviews with teachers and administrators. The interviews indicated that stand-alone teachers generally had small classes (between 8 and 12 students), whereas collaborative teachers generally worked with large classes of 25 to 30 students. Therefore, the relationship between class size and work arrangement has an institutional flavor that reflects a district level decision on how work is

organized. Given the very high correlation coefficient between class size and work organization, I dropped class size from subsequent analyses.

The presence of a paraprofessional in a classroom was significantly and positively correlated with work organization ($r=.24$, $p<.01$), with teachers who had a paraprofessional in their class being more likely to work in stand-alone arrangements. Teachers who had a paraprofessional in their classes were also more likely to encounter increased task complexity ($r=.30$, $p<.01$), and engage in less relational crafting ($r=-.13$, $p<.01$). They were also likely to be more committed to their schools ($r=.08$, $p<.05$). Preliminary analyses indicated that the presence of a paraprofessional had no significant effect on the variables of interest in the study, and therefore was dropped from subsequent analyses.

As defined in the methods chapter, work organization captures whether a teacher works collaboratively or stand-alone in the classroom. Correlations indicated that teachers in stand-alone class structures, compared to teachers in collaborative classes, tended to be older ($r=.09$, $p<.05$), which is consistent with the interviews. The interviews revealed that older teachers preferred to teach alone and stick with the stand-alone classes, whereas younger teachers were more willing to take on collaborative classes and teach in teams. Compared to teachers in collaborative arrangements, teachers in stand-alone classes were also less interdependent with others, as expected ($r=-.12$, $p<.01$). They also had higher complexity levels in their task environment ($r=.56$, $p<.01$), which mat reflect in part the fact that they were working exclusively with students with disabilities, whereas collaborative teachers generally taught mixed classes (classes mixing students with disabilities and regular education students). Stand-alone teachers also engaged in more intensive task crafting ($r=.13$, $p<.01$) and less relational crafting ($r=-.11$, $p<.01$). Finally, compared to teachers in collaborative arrangements, teachers in stand-alone arrangements were less satisfied with their jobs ($r=-.11$, $p<.01$) and more likely to stay in the school district ($r=-.09$, $p<.05$).

Finally, among the control variables, teachers' professional identification with the special education profession was significantly and positively correlated with cognitive crafting ($r=.14$, $p<.01$) and organizational commitment ($r=10$, $p<.05$), suggesting that teachers who identified more strongly with

their profession were more likely to see their jobs as more meaningful and significant and be more committed to their schools.

Each of the independent variables (discretion, task interdependence, and task complexity) was expected to be significantly correlated with each of the job crafting components examined in the study. Discretion was significantly and positively correlated with task crafting ($r=.25$, $p<.01$), suggesting that teachers who had more discretion in work were more likely to craft their tasks. There was no significant correlation between discretion and cognitive and relational crafting. Similarly, task complexity was significantly correlated with task crafting ($r=.15$, $p<.01$), with teachers working in more complex task environments being more likely to engage in task crafting. Interestingly, task interdependence was significantly and positively correlated with relational crafting ($r=.12$, $p<.01$), suggesting that more interdependent teachers engaged in more relational crafting. Two of the independent variables were also significantly correlated with the some of the outcome variables of interest. Thus, teachers who perceived more discretion in their work were likely to be more satisfied with their jobs ($r=.24$, $p<.01$) and more committed to their schools ($r=.31$, $p<.01$). Similarly, teachers who were more interdependent with others at work were likely to report higher job satisfaction ($r=.13$, $p<.01$) and higher organizational commitment ($r=.24$, $p<.01$).

Among the job crafting components, only cognitive and relational crafting were positively and significantly correlated ($r=.09$, $p<.05$), suggesting that teachers who engaged in more relational crafting were also more likely to see their jobs as more meaningful and significant. Task crafting was not significantly correlated with any of the other facets of job crafting.

It was anticipated that the job crafting variables would be related to the outcomes of interest – by positively influencing job satisfaction and organizational commitment, and negatively affecting teacher turnover. As expected, task crafting was significantly correlated with organizational commitment ($r=.10$, $p<.05$), but had no significant relationship to job satisfaction or turnover. As expected, cognitive crafting was positively correlated with both job satisfaction ($r=.25$, $p<.01$) and organizational commitment ($r=.14$, $p<.01$). Relational crafting was, as expected, significantly correlated with both job satisfaction ($r=10$,

p<.05) and organizational commitment (r=.09, p<.05). None of the job crafting variables was significantly correlated with turnover. Finally, some of the outcome variables were significantly correlated. As expected, job satisfaction was significantly and positively correlated with organizational commitment (r=.52, p<.01). Also, teachers who were more satisfied with their jobs were less likely to leave the school (r=-.13, p<.01) and the district (r=-.10, p<.05). Similarly, teachers who were more committed to their schools were less likely to leave the school (r=-.11, p<.05) and the school district (r=-.09, p<.05).

Table 24 Means, Standard Deviations, and Zero-Order Correlations

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. Age[a]	-	-										
2. Gender[b]	0.11	0.31	.02									
3. Skills	4.09	2.26	-.11*	.00								
4. Experience[a]	-	-	.67**	-.10*	-.07							
5. Training (hours)	10.09	12.88	.03	.08	-.06	.00						
6. Grade level[c]	0.57	0.49	-.01	.07	.11**	.01	.05					
7. Class size[d]	0.26	0.44	-.10**	-.06	.13**	-.04	.03	-.13**				
8. Paraprofessional[e]	0.72	0.44	.04	.04	-.07	.00	-.02	-.21**	-.25**			
9. Work organization[f]	0.73	0.44	.09*	.03	-.12**	.04	-.05	.12**	-.94**	.24**		
10. Discretion	3.24	0.76	.00	-.06	-.05	.02	-.01	-.02	-.07	.05	.05	
11. Task interdependence	2.81	0.78	.06	.03	.07	.05	.04	-.02	.11**	.06	-.12**	-.01
12. Task complexity	2.19	2.55	.11**	.03	-.12**	.06	-.02	.08*	-.55**	.30**	.56**	.10*
13. Profess. identification	3.57	0.89	-.08*	-.01	-.07	-.04	-.02	.01	-.03	.02	-.01	-.01
14. Task crafting	3.23	0.49	.02	-.03	-.04	.11**	.00	.03	-.12**	.07	.13**	.25**
15. Cognitive crafting	4.08	0.55	-.10*	-.10*	.13**	-.09*	.06	.00	.06	.05	-.04	.06
16. Relational crafting	0.24	1.44	.04	.09*	.10*	.05	.08	.08	.10*	-.13**	-.11**	-.04
17. Job satisfaction	3.79	0.73	.01	-.06	.01	.01	.04	-.07	.10*	.01	-.11**	.24**
18. Organiz. commitment	3.53	0.91	.13**	-.04	-.02	.14**	.04	-.07	.03	.08*	-.07	.31**
19. Turnover from school[g]	0.29	0.45	-.04	.01	.02	-.07	-.03	.01	.09*	-.01	-.08	-.01
20. Turnover from district[g]	0.25	0.43	-.03	.01	.04	-.06	-.02	-.01	.08	-.03	-.09*	-.02

[a] See Table 25 for categorical variables
[b] Coding: 0=female, 1=male
[c] Coding: 0= not tested (K, 1st or 2nd grades), 1= tested (3rd -5th grades)
* p<0.05, ** p<0.01
[d] Coding: 0=small (≤15), 1=large (>15)
[e] Coding: 0=no, 1=yes
[f] Coding: 0=collaborative, 1=stand-alone
[g] Coding: 0=stayed, 1=left

Table 24 (continued)

Variables	11	12	13	14	15	16	17	18	19
1. Age[a]									
2. Gender[b]									
3. Skills									
4. Experience[a]									
5. Training (hours)									
6. Grade level[c]									
7. Class size[d]									
8. Paraprofessional[e]									
9. Work organization[f]									
10. Discretion									
11. Task interdependence									
12. Task complexity	-.06								
13. Profess. identification	.14**	.13**							
14. Task crafting	.03	.15**	.02						
15. Cognitive crafting	.04	-.02	.14**	.03					
16. Relational crafting	.12**	-.02	-.02	.07	.09*				
17. Job satisfaction	.13**	-.07	.07	.05	.25**	.09*			
18. Organiz. commitment	.24**	-.01	.10*	.10**	.14**	.09*	.52**		
19. Turnover from school[g]	-.01	-.05	-.02	-.03	-.02	.03	-.13**	-.11*	
20. Turnover from district[g]	.02	-.03	-.04	-.03	-.01	.02	-.10*	-.09*	.91**

[a] See Table 25 for categorical variables
[b] Coding: 0=female, 1=male
[c] Coding: 0= not tested (K, 1st or 2nd grades), 1= tested (3rd -5th grades)
* p<0.05, ** p<0.01
[d] Coding: 0=small (≤15), 1=large (>15)
[e] Coding: 0=no, 1=yes
[f] Coding: 0=collaborative, 1=stand-alone
[g] Coding: 0=stayed, 1=left

Table 25 Descriptives for Categorical Variables

Variables	Percentage in each category
Age	10.8% - under 25 years old 36% - 25-34 years old 18.5% - 35-44 years old 27% - 45-54 years old 7.5% - 55-64 years old 0.2% - 65 years or older
Experience	11.2% - less than one year 3.1% - 1 year 9.5% - 2 years 7.6% - 3 years 6.7% - 4 years 7.2% - 5 years 21% - 6-10 years 9.6% - 11-15 years 24.1% - 16 years or more

Table 26 Special Education Teachers by Form of Work Organization

Work organization	Number of teachers[a]	% of teachers
Stand-alone	456	70.8%
Collaborative	170	26.4%
SETSS (Support services)	7	1.1%
IEP (Individualized education plan)	3	0.5%
Other	2	0.3%
Multiple options checked	6	0.9%

[a] N=644 teachers who answered this question

Table 27 summarizes the means, standard deviations, and zero-order correlations of the organization-level variables used in the study. The mean number of teachers in a school was 54.62, with a mean number of 5.33 special education teachers per school. It is interesting to note that there was much more diversity in the strength of the occupational communities of practice of special education teachers across schools than in the overall agreement on beliefs among all teachers in each school (s.d.=13.49 versus s.d.=1.89). Also, the mean value of the occupational community of practice was higher than that for the overall school-level agreement on beliefs among all teachers (M=14.83 compared to M=10.49). Thus, although the occupational communities of practice are stronger on average than the overall school-level agreement on beliefs about teaching among all teachers in the school, the strength of the occupational community of practice varies much more highly from school to school.

School size was positively correlated with the number of special education teachers in the school ($r=.31$, $p<.01$) and with school SES ($r=.17$, $p<.05$), with larger schools being more likely to have more special education teachers and have students coming from lower income families.

The number of special education teachers in a school was significantly and negatively correlated with the strength of the occupational community of practice of special education teachers ($r=-0.20$, $p<0.05$). School SES was significantly and positively correlated with school turnover ($r=.16$, $p<.05$), suggesting that poorer schools were more likely to have increased teacher turnover rates. Teachers in poorer schools were also less likely to achieve agreement on beliefs about teaching ($r=-.16$, $p<.05$). Schools with higher turnover rates were more likely to have stronger occupational communities of practice. Finally, the strength of the occupational community of practice of special education teachers was significantly correlated with the overall agreement on beliefs about teaching among all teachers in the school ($r=.23$, $p<.01$).

Table 27 Means, Standard Deviations, and Zero-Order Correlations of Variables at Organization Level

Variables	Mean	SD	1	2	3	4	5
1. School size (number of teachers)	54.62	19.64					
2. Number of special education teachers	5.33	3.34	.31**				
3. School SES	70.81	22.68	.17*	-.01			
4. School turnover (previous year)	13.71	6.79	.02	-.04	.16*		
5. Agreement on beliefs overall school	10.49	1.89	-.11	-.10	-.16*	-.10	
6. Occupational community of practice	14.83	13.49	.09	-.20*	-.03	.17*	.23**

N=200
* p<0.05, ** p<0.01

7.2 PRELIMINARY ANALYSES

In this section, interview findings and t-tests results (Table 28) are presented to illustrate some of the differences in teachers' jobs between the two types of work organization – collaborative and stand-alone. As summarized in the previous section, correlations suggest that the type of work organization arrangement influences to a significant degree many of the variables of interest in the study. Further, the field observations and interviews I conducted with various teachers and administrators suggested that the two categories of special education teachers have different jobs, at least in terms of some of the variables of interest in this study.

For example, stand-alone teachers were placed to work in classes with students having each some type of disability, whereas collaborative teachers worked in classes having both students with disabilities and students with no disability. Interviews indicated that stand-alone teachers typically taught smaller classes, whereas collaborative teachers typically taught larger classes. T-test results also supported this finding ($t=65.88$, $p<.01$). Collaborative teachers were also less satisfied with class sizes than stand-alone teachers ($t=-3.73$, $p<.01$). According to the interviews, stand-alone teachers had more freedom to plan their own lessons than collaborative teachers, who generally had to discuss weekly and plan their work with the other teacher in the class. However, t-tests indicated no significant difference in discretion between the two types of teachers.

Stand-alone teachers interviewed also reported they were generally more isolated from other teachers in their schools and interacting less frequently with others than collaborative teachers. To support this finding, t-tests also suggested that stand-alone teachers were less interdependent with others ($t=2.96$, $p<.01$) and engaged in less relational crafting than their collaborative peers ($t=2.66$, $p<.01$). Stand-alone teachers also reported in the interviews that their jobs were difficult because they had to deal with multiple grade levels in their classes. Some teachers also reported that they had cases when students in their classes were not placed at the appropriate grade level, which increased the difficulty of their jobs. T-

tests also indicated that stand-alone teachers, compared to collaborative teachers, had more complex tasks ($t=-16.82$, $p<.01$), and engaged in more task crafting ($t=-3.28$, $p<.01$).

In terms of job satisfaction, interviews revealed that stand-alone teachers liked their increased autonomy but disliked the lower support they generally received from their schools. Several stand-alone teachers interviewed reported they did not receive help (in terms of proper resources and materials) from the school administration on job specific issues. For instance, some stand-alone teachers indicated they did not receive books that other teachers in the same school received, some others did not receive all the materials that accompany the curriculum, and others reported they did not receive the job training they asked for. In contrast, collaborative teachers liked the increased support they received from the school. The t-tests provided support for these interview findings. Collaborative teachers were generally more satisfied with their jobs than stand-alone teachers ($t=2.72$, $p<.01$).More specifically, when looking at the role of the lack of support and materials that affected teachers' satisfaction, stand-alone teachers reported less satisfaction with curriculum materials provided ($t=-2.88$, $p<.01$), access to information technology resources ($t=-1.83$, $p<.10$), and administration support ($t=-.1.94$, $p<.10$).

Interestingly, four stand-alone teachers interviewed reported that they "would love to work in a collaborative team, if given the opportunity", suggesting that, at least in some schools included in the study, working in a stand-alone or collaborative arrangement was not teachers' choice. It is also interesting to note, in this context, that two administrators reported that new or younger teachers were more amenable to work in collaborative arrangements because they were "more adaptable to work in teams". In contrast, the administrators reported that more seasoned teachers liked to be more independent and therefore preferred to work in stand-alone arrangements. An alternative explanation to this might be that younger teachers were less powerful and had to do what their principal told them to do.

Given these more nuanced differences between collaborative and stand-alone teachers, work organization was included as control variable, as well as interaction terms between work organization and the variables of interest in the study, to detect any differences between the two types of work organization.

Table 28 Results of T-tests Comparing Stand-alone and Collaborative Teachers

Variable	Collaborative	Stand-alone	Significance
Age	2.67	2.90	*
Gender	0.09	0.12	n.s.
Skills	4.50	3.92	**
Experience	5.75	5.97	n.s.
Training	11.15	9.71	n.s.
Grade level	0.48	0.61	**
Class size	0.94	0.01	**
Paraprofessional	0.56	0.79	**
Discretion	3.18	3.25	n.s.
Task interdependence	2.96	2.75	**
Task complexity	-0.12	3.06	**
Professional identification with special education	3.58	3.56	n.s.
Task crafting	3.12	3.26	**
Cognitive crafting	4.11	4.07	n.s.
Relational crafting	0.49	0.13	**
Job satisfaction	3.93	3.75	**
Organizational commitment	3.62	3.48	†
Turnover from school	0.37	0.27	†
Turnover from district	0.34	0.23	†

** $p<0.01$, * $p<0.05$, † $p<0.10$

7.3 TESTS OF HYPOTHESES

The first set of hypotheses proposed a direct effect of each of the work context variables (discretion, task interdependence, task complexity, and teacher community of practice) on job crafting. Because the independent variables were measured at two levels of analysis – (1) individual level (discretion, task

interdependence, and task complexity) and (2) organization level (teacher community of practice), I tested these hypotheses using Hierarchical Linear Modeling (HLM). HLM permits the analysis of multi-level data by simultaneously estimating effects across levels and partitioning explained variance by level (Raudenbush & Bryk, 2002). Given the nested structure of the data in this study, with teachers embedded in schools, I specified teachers as the level-1 data and schools as the level-2 data. I first ran the HLM analyses using as dependent variable each facet of job crafting – task crafting, cognitive crafting, and relational crafting.

To estimate the magnitude of variation between schools in job crafting, I first tested a model with no predictors at either level (referred to in the HLM analysis as the unconditional model). Variance decomposition between the two levels of analysis shows that most of the variance in job crafting lies between teachers. Thus, 92.46% of variance in teachers' task crafting lies between individuals, whereas 7.64% lies between schools. For cognitive crafting, there is almost no variance to be explained at organizational level; 99.95% of variance in teachers' cognitive crafting lies between individuals, whereas 0.05% lies between schools. Finally, 94% of variance in teachers relational crafting lies between individuals, whereas 6% lies between schools.

7.3.1 Predictors of Job Crafting

Table 29 presents the results of the HLM analyses for the predictors of job crafting. It summarizes the results for each of the three facets of job crafting used as dependent variables. I examine the results for each of the job crafting facets in turn. I first examine the effects of the control variables at each level of analysis, and follow this with an examination of the effects of the main variables of interest in the study.

Predictors of Task Crafting. As indicated in Table 29, the model for task crafting explains 11.35% of the variance at individual level and 1.40% of the variance at organizational level. Among the control variables at level 1, experience had a positive and significant impact on task crafting, as expected (γ=0.029, $p<0.01$), with more experienced teachers engaging in more task crafting than less experienced ones. Professional identification had no significant effect on task crafting (γ=0.004, $p>0.10$). At the

school level, school turnover had a negative effect on task crafting, although only marginally significant (γ=-0.007, $p<0.10$), suggesting that in schools with higher levels of teacher turnover, teachers are less likely to craft their tasks.

Discretion had a positive and significant effect on teachers' task crafting, as hypothesized (γ=0.159, $p<0.01$), indicating initial support for hypothesis H1. Similarly, as hypothesized, task complexity had a positive and significant impact on task crafting (γ=0.025, $p<0.01$), indi cating initial support for hypothesis H2. Contrary to predictions, interdependence had a positive and significant effect on task crafting (γ=0.075, $p<0.05$), suggesting an enabling role of interdependence rather than an inhibiting role. Occupational community of practice had no significant effect on task crafting (γ=0.001, $p>0.10$).

Predictors of Cognitive Crafting. As indicated in Table 29, the model explains 2.00% of the variance at individual level and no variance at organizational level. Among the control variables at level 1, teacher skills had a positive and significant impact on cognitive crafting, as expected (γ=0.026, $p<0.05$), with more skilled teachers ascribing more meaningfulness to their work than less skilled ones. Professional identification had a positive and significant effect on cognitive crafting (γ=0.066, $p<0.05$), with teachers who identified more strongly with their profession being more likely to ascribe increased meaningfulness to their work. School-level control variables had no significant effect on cognitive crafting.

Table 29 Predictors of Job Crafting

Variable	Dependent Variable		
	Task Crafting	**Cognitive Crafting**	**Relational Crafting**
Total variance at level-2	*7.64%*	*0.05%*	*6.00%*
Intercept (γ_{00})	3.062**	3.992**	0.198
Level-1: Individual (γ_{i0})			
Experience	0.029**	-0.011	0.063*
Grade level[1]	0.019	-0.029	0.298*
Skills	0.008	0.026*	0.033
Work organization[2]	0.067	-0.020	-0.513**
Professional identification	0.004	0.066*	-0.011
Discretion	0.159**	0.135**	0.028
Interdependence	0.075*	0.053	0.362**
Task complexity	0.025**	0.001	0.051
Variance explained level-1	*11.35%*	*2.00%*	*9.22%*
Level-2: Organization (γ_{0j})			
School size	0.000	-0.001	-0.007†
# special education teachers	-0.004	0.010	0.024
School SES[3]	0.000	0.001	0.009**
School turnover	-0.007†	-0.003	0.005
Overall agreement on beliefs	0.007	0.012	0.032
Occupational comm. of practice	0.001	0.000	0.001
Variance explained level-2	*1.40%*	*0%*	*25.26%*

** p≤0.01; * p≤0.05; † p≤0.10

[1] Coding: 0=grades not tested (k-2nd), 1=grades tested (3rd-5th)

[2] Coding: 0=collaborative, 1=stand-alone

[3] Coding: % of students eligible for free or reduced lunch

Discretion had a positive and significant effect on teachers' cognitive crafting, as hypothesized (γ=0.135, $p<0.01$), indicating additional support for hypothesis H1. Surprisingly, task complexity had no significant impact on cognitive crafting (γ=0.001, $p>0.10$). Further, interdependence had no significant effect on cognitive crafting (γ=0.053, $p>0.10$), although the sign was positive (as in the case of task crafting as dependent variable), suggesting again an enabling role of interdependence. Occupational community of practice had no significant effect on cognitive crafting.

Predictors of Relational Crafting. As indicated in Table 29, the model explains 9.22% of the variance at individual level and 25.26% of the variance at organizational level. Among the control variables at level 1, experience had a positive and significant impact on relational crafting, as expected (γ=0.063, $p<0.05$), with more experienced teachers engaging in more relational crafting than less experienced ones. Teachers who taught students at tested grade levels were more likely to engage in relational crafting (γ=0.298, $p<0.05$). Further, work organization had a significant impact on relational crafting (γ=-0.513, $p<0.01$), with stand-alone teachers being less likely to engage in relational crafting than collaborative teachers. Presumably, this might be due to the less interdependent type of work of stand-alone teachers. Professional identification had no significant effect on relational crafting. At the school level, school size had a negative effect on relational crafting (γ=-0.007, $p<0.10$), with teachers in larger schools being less likely to engage in relational crafting. School SES had a positive and significant effect on relational crafting (γ=0.009, $p<0.01$), suggesting that teachers in poorer schools were more likely to engage in relational crafting.

Surprisingly, there was no significant effect of discretion and task complexity on relational crafting. Contrary to predictions, interdependence had a positive and significant effect on relational crafting (γ=0.362, $p<0.01$), suggesting again an enabling role of interdependence, as in the case of task crafting. Occupational community of practice had no significant effect on relational crafting.

Moderating Effects of Work Organization. Since work organization had a significant effect on teachers' relational crafting, I explored further the nature of this relationship. I reasoned that work organization might moderate the impact of other variables on relational crafting. Since collaborative

teachers were more likely to engage in relational crafting than stand-alone teachers (see t-tests results in Table 28), it might be that work organization interacted with other structural or relational factors in the context of work. In particular, I explored two potential interaction effects.

First, task complexity might interact with work organization in such a way that complexity has a stronger effect on relational crafting by collaborative teachers than on relational crafting by stand-alone teachers. Since collaborative teachers are more integrated with the rest of the organization than stand-alone teachers (having daily contact with their co-teacher, a regular education teacher), increased task complexity may trigger them to engage in more intense relational crafting to solve the complex demands of their jobs more effectively. Thus, I expected a negative and significant moderation effect of work organization on the relationship between task complexity and relational crafting.

Second, occupational community of practice might interact with work organization in such a way that occupational community of practice has a stronger effect on relational crafting by collaborative teachers than on relational crafting by stand-alone teachers. Again, because collaborative teachers are more integrated with the rest of the organization than stand-alone teachers, a stronger community of practice may trigger them to engage in more intense relational crafting to get their jobs done more effectively. Thus, I expected a negative and significant moderation effect of work organization on the relationship between occupational community of practice and relational crafting.

The results of the moderation analysis are presented in Table 30[3]. As expected, I found a significant moderating effect of work organization on the effect of task complexity on relational crafting (γ=-0.170, $p<0.05$). The interaction effect between work organization and task complexity is graphically depicted in Figure 9. The results show that task complexity has a stronger positive effect on the relational crafting of collaborative teachers than on that of stand-alone teachers. Although the interaction term between work organization and task complexity was significant in the HLM analysis, there was no

[3] Similar moderating models were also run using task and cognitive crafting as dependent variables, respectively. Results indicated that work organization did not have significant moderating effects in none of these two cases.

significant difference between the slopes corresponding to collaborative versus stand-alone work organization in Figure 9 ($F=0.917$, $p=0.339$).

Further, as expected, I found a significant moderating effect of work organization on the effect of community of practice on relational crafting ($\gamma=-0.024$, $p<0.05$). The interaction effect between work organization and occupational community of practice is graphically depicted in Figure 10. The results show that occupational community of practice has a stronger positive effect on the relational crafting of collaborative teachers than on the relational crafting of stand-alone teachers. Although the interaction term between work organization and community of practice was significant in the HLM analysis, there was no significant difference between the slopes corresponding to collaborative versus stand-alone work organization in Figure 10 ($F=0.783$, $p=0.377$).

Table 30 Moderating Effects of Work Organization

Variable	Dependent Variable: Relational Crafting	
	Model 1 Direct effects	**Model 2 Moderating effects of work organization**
Intercept (γ_{00})	0.198	0.503†
Level-1: Individual (γ_{i0})		
Experience	0.063*	0.061*
Grade level[1]	0.298*	0.321**
Skills	0.033	0.038
Work organization[2]	-0.513**	-0.692**
Discretion	0.028	0.041
Interdependence	0.362**	0.366**
Task complexity	0.051	0.043
Professional identification	-0.011	-0.003
*Work organization * Task complexity*		*-0.170**
Variance explained level-1	*9.22%*	*10.52%*
Level-2: Organization (γ_{0j})		
School size	-0.007†	-0.007
Number of special education teachers	0.024	0.019
School SES[3]	0.009**	0.010**
School turnover	0.005	0.003
Overall agreement on beliefs	0.032	0.021
Occupational community of practice	0.001	0.018*
*Work organization. * Community of practice*		*-0.024**
Variance explained level-2	*25.26%*	*25.26%*

** p≤0.01; * p≤0.05; † p≤0.10

[1] Coding: 0=grades not tested (k-2nd), 1=grades tested (3rd-5th)

[2] Coding: 0=collaborative, 1=stand-alone

[3] Coding: % of students eligible for free or reduced lunch

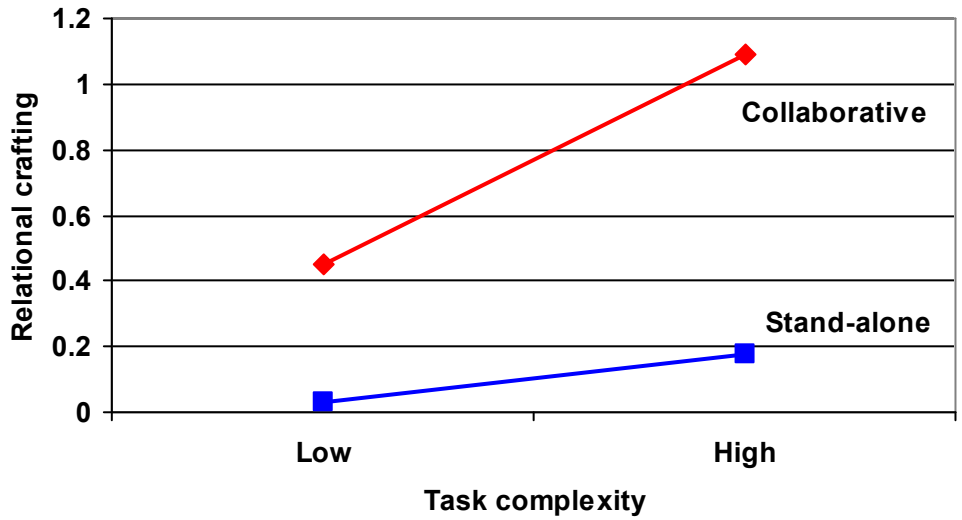


Figure 9 Interaction Effect between Work Organization and Task Complexity

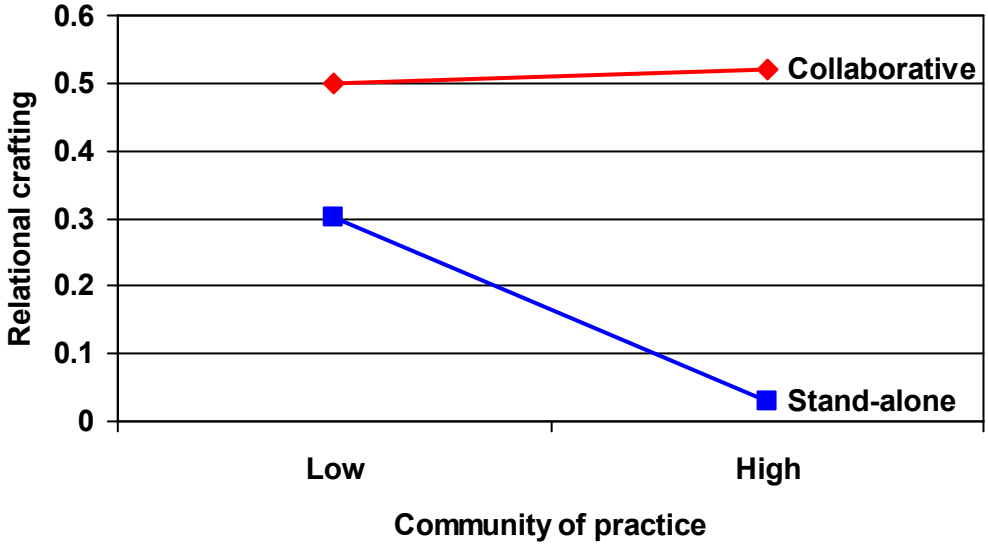


Figure 10 Interaction Effect between Work Organization and Community of Practice

7.3.2 Outcomes of Job Crafting

To explore the extent to which job crafting enhances teachers' work experiences, I conducted HLM analyses using two types of affective outcomes for teachers – job satisfaction and organizational commitment. One of the major problems faced by public schools is the high turnover rates among special education teachers. Thus, increasing teachers' job satisfaction and attachment to their schools is a critical goal for the administration of public schools. Job satisfaction and organizational commitment are two important indicators of teachers' attachment to their jobs and organizations, with potential critical consequences for retaining teachers in schools. Table 31 shows the results of the HLM analyses.

Effects on Job Satisfaction. The proportion of variance at the organizational level for job satisfaction was 9.75%, suggesting that most of the variance to be explained in teachers' job satisfaction was at the individual level (90.25% variance was between teachers, while 9.75% variance was between schools). As indicated in Table 31, the model for job satisfaction explains 18.56% of the variance at individual level and 21.57% of the variance at organizational level in job satisfaction. As expected, discretion had a positive and significant effect on teachers' job satisfaction levels (γ=0.209, $p<0.01$), with teachers who experienced increased discretion in work being more satisfied with their jobs. Skills had a marginally significant negative effect on job satisfaction (γ=-0.027, $p<0.10$). At the organizational level, only school SES had a negative and significant effect on job satisfaction, as expected (γ= -0.004, $p<0.05$), with teachers in poorer schools being less likely to be satisfied with their jobs.

Among the job crafting variables, both cognitive and relational crafting had positive and significant effects on job satisfaction, as predicted (γ=0.179, $p<0.01$ for cognitive; γ=0.071, $p<0.01$ for relational). Task crafting had no significant effect on satisfaction, although the sign was in the expected direction. This indicates that crafting, at least in its relational and cognitive components, positively influences job satisfaction above and beyond other work context factors.

Table 31 Outcomes of Job Crafting: Job Satisfaction and Organizational Commitment

Variable	**Dependent Variable**	
	Job Satisfaction	**Org. Commitment**
Total variance at level-2	*9.75%*	*24.76%*
Intercept (γ_{00})	4.118**	3.765**
Level-1: Individual (γ_{i0})		
Experience	0.000	0.031†
Grade level[1]	-0.088	-0.051
Skills	-0.027†	-0.047*
Work organization[2]	-0.125	-0.051
Professional identification	-0.064	-0.068
Discretion	0.209**	0.302**
Interdependence	0.079	0.210**
Task complexity	-0.010	0.010
Task crafting	0.122	0.090
Cognitive crafting	0.179**	0.244**
Relational crafting	0.071**	0.061†
Variance explained level-1	*18.56%*	*21.18%*
Level-2: Organization (γ_{0j})		
School size	0.001	0.001
# special education teachers	-0.009	-0.002
School SES[3]	-0.004*	-0.010**
School turnover	-0.009	-0.025**
Overall agreement on beliefs	-0.031	-0.026
Occupational community of practice	0.003	0.006†
Variance explained level-2	*21.57%*	*38.45%*

** p≤0.01; * p≤0.05; † p≤0.10

[1] Coding: 0=grades not tested (k-2nd), 1=grades tested (3rd-5th)

[2] Coding: 0=collaborative, 1=stand-alone

[3] Coding: % of students eligible for free or reduced lunch

Effects on Organizational Commitment. The proportion of variance at the organizational level for organizational commitment was 24.76%, suggesting that – compared to job satisfaction, which varied mostly between teachers – commitment varied to a larger degree between schools (75.24% variance was between teachers, while 24.76% variance was between schools). As indicated in Table 31, the model for commitment explains 21.18% of the variance at individual level and 38.45% of the variance at school level in commitment.

Experience had a positive effect on teachers' attachment to their schools, as expected (γ=0.031, $p<0.10$), with more experienced teachers being more attached to their schools. Skills had a negative and significant effect on commitment (γ=-0.047, $p<0.05$), suggesting that more skilled teachers were less attached to their schools. These findings confirm the general expectations that, while more tenured teachers tend to be more committed to their schools, more skilled teachers tend to be less committed and more mobile on the job market due to their increased human capital levels. Work discretion and interdependence had positive effects on commitment (γ=0.302, $p<0.01$ for discretion; γ=0.210, $p<0.01$ for interdependence). Thus, teachers who experienced increased discretion in work were likely to be more committed to their schools. Also, teachers who reported increased work interdependence with others were likely to be more committed to their schools.

At the organizational level, as expected, both school SES and school turnover had negative and significant effects on teachers' commitment (γ=-0.010, $p<0.01$ for school SES; γ=-0.025, $p<0.01$ for school turnover). This suggests that teachers in poorer schools tended to be less committed to their schools, in part because of the increased discipline problems with students in poorer schools. Similarly, teachers in schools with higher levels of turnover in the previous school year tended to be less attached to their schools. There also was a positive effect of occupational community of practice on teachers' commitment (γ=0.006, $p<0.10$), suggesting that teachers in schools with stronger occupational communities of practice are likely to be more attached to their schools. Thus, occupational communities of practice within the schools may play a role in retaining special education teachers.

Among the job crafting variables, both cognitive and relational crafting had positive and significant effects on commitment (γ=0.244, p<0.01 for cognitive; γ=0.061, p<0.10 for relational). Task crafting had no significant effect on commitment, although the sign was in the expected direction. This indicates that crafting, at least in its relational and cognitive components, positively influences teachers' commitment above and beyond other work context factors.

Effects on Individual Turnover. Two additional HLM analyses were run using teacher turnover as dependent variable (Table 32). I explored two types of turnover - turnover from the school (whether the teacher left the school at the end of the school year when the survey was conducted) and turnover from the school district (whether the teacher left the school district at the end of the school year when the survey was conducted). A number of 157 special education teachers (29.1%) left their schools at the end of the school year. 136 special education teachers (25.2%) left the school district at the end of the school year when the survey was conducted.

Since turnover is a dichotomous variable that takes on the value of zero or unity (indicating that a teacher either stayed or left the school district), I followed the suggestions of Raudenbush and Bryk (2002) for the treatment of binary dependent variables and used the hierarchical generalized linear modeling technique (HGLM). Therefore, the Bernoulli level-1 sampling model and the logit link function at level-1 were used in these analyses[4].

The proportion of variance at the organizational level for turnover from the school was 2.84%, suggesting that turnover from school varied mostly between teachers (97.16% variance was between teachers, while 2.84% variance was between schools). Among the individual-level variables, only professional identification had a significant effect on turnover from school (γ=.393, p<.05), with teachers

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[4] The logit link function used was $\eta_{ij} = \log\left[\varphi_{ij} / \left(1 - \varphi_{ij}\right)\right]$, where φ_{ij} is the expected level-1 outcome – the probability of turnover for teacher *i* in school *j*, or $\varphi_{ij} = \Pr ob\left(Y_{ij} = 1\right)$; Y_{ij} is the turnover outcome for teacher *i* in school *j*; and η_{ij} is the log of the odds of turnover. φ_{ij} can take on values between 0 and 1, whereas η_{ij} can take on any real value. When the probability of turnover is $\varphi_{ij} = .5$, the log-odds of turnover or logit is η_{ij}=0. When the

who identified more strongly with the special education profession being more likely to leave their schools. At the organizational level, school size had a significant negative effect on turnover (γ=-.020, p<.01), suggesting that teachers in larger schools were less likely to leave their schools. Although the job crafting variables did not significantly impact teacher turnover from the school, both task and cognitive crafting had negative effects on turnover, as expected. It is interesting to note that the task crafting coefficient was particularly large (γ=-.253).

The results for the turnover from the district are similar to those for turnover from the school. The proportion of variance at the organizational level for turnover from the district was 2.91%, suggesting that turnover from the district varied mostly between teachers (97.09% variance was between teachers, while 2.91% variance was between schools). Among the individual-level variables, only professional identification had a significant effect on turnover from the district (γ=.374, p<.05), with teachers who identified more strongly with the special education profession being more likely to leave the school district. At the organizational level, school size had a significant negative effect on turnover (γ=-.019, p<.01), suggesting that teachers in larger schools were less likely to leave the school district. Although the job crafting variables did not significantly impact teacher turnover from the district, both task and cognitive crafting had negative effects on turnover, as expected. As in the case of turnover from the school, it is interesting to note that the task crafting coefficient was particularly large (γ=-.237).

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probability of turnover is less than .5, the logit is negative. When the probability of turnover is greater than .5, the logit is positive.

Table 32 Outcomes of Job Crafting: Individual Turnover

Variable	Dependent Variable	
	Turnover from school	**Turnover from school district**
Total variance at level-2	*2.84%*	*2.91%*
Intercept (γ_{00})	-0.714†	-1.049**
Level-1: Individual (γ_{i0})		
Experience	-0.014	0.001
Grade level[1]	-0.213	-0.209
Skills	0.057	0.080
Work organization[2]	-0.304	-0.171
Professional identification	0.393*	0.374*
Discretion	0.075	0.051
Interdependence	-0.041	0.111
Task complexity	-0.045	-0.053
Task crafting	-0.253	-0.237
Cognitive crafting	-0.066	-0.090
Relational crafting	0.020	0.009
Variance explained level-1	*0.83%*	*0.64%*
Level-2: Organization (γ_{0j})		
School size	-0.020**	-0.019*
# special education teachers	0.036	0.038
School SES[3]	0.005	0.003
School turnover	0.014	0.020
Overall agreement on beliefs	0.141	0.143
Occupational community of practice	-0.001	0.005
Variance explained level-2	*83.19%*	*59.65%*

** p≤0.01; * p≤0.05; † p≤0.10

[1] Coding: 0=grades not tested (k-2nd), 1=grades tested (3rd-5th)

[2] Coding: 0=collaborative, 1=stand-alone

[3] Coding: % of students eligible for free or reduced lunch

7.4 SUMMARY OF RESULTS STUDY 2

This section summarizes the results of the statistical analyses conducted to test the hypotheses in Study 2. A summary of the hypotheses tests discussed below is presented in Table 33. Hypothesis H1 posited that discretion would significantly predict job crafting behaviors. As predicted, I found evidence that discretion facilitated teachers' task and cognitive crafting. Thus, hypothesis H1 received partial support in Study 2. Hypothesis H2 stated that task complexity would significantly predict job crafting behaviors. As predicted, increased complexity in the tasks facilitated teachers' task crafting. Although the effect of task complexity on relational crafting was not significant, work organization moderated this effect, such that increased complexity had a stronger positive effect on relational crafting for collaborative than for stand-alone teachers. Thus, hypothesis H2 was partially supported. These results highlight the idea that while task complexity provides opportunities for exploratory work processes, it is the way work is organized that influences how people deal with the increased levels of complexity in their tasks. When work is organized to facilitate collaboration, the positive relationship between task complexity and relational crafting is stronger than when work organization promotes isolation.

According to hypothesis H3, task interdependence would significantly and negatively influence job crafting. Contrary to predictions, I found that increased interdependence with others enabled rather than inhibited task and relational crafting by special education teachers. Therefore, hypothesis H3 was not supported. These results suggest that the relationship between interdependence and job crafting might be an enabling rather than an inhibiting one. The reasoning for the hypothesis was based on the increased value that workers – and in particular professional workers, like special education teachers - put on independence at work and the free exercise of their professional judgment and authority in work situations. However, in this study, special education teachers who experienced more interdependence tailored and expanded their tasks more and engaged in more intensive relational crafting. It might have been that more interdependent special education teachers crafted their tasks and relationships more because interdependence allowed them to develop a broader view and a deeper understanding of the inter-

connections between their work and the work of others in the organization, and thus provided more resources (e.g., information, inter-personal trust) that enabled their crafting.

Hypothesis H5 predicted that the strength of the occupational community of practice would positively influence teachers' job crafting. Contrary to predictions, the strength of special education teachers' occupational community of practice within the school did not have a direct significant effect on teachers' job crafting. However, community of practice interacted with work organization. The positive effect of community of practice was stronger for collaborative than for stand-alone teachers, suggesting that collaborative work arrangements help teachers to better draw on the resources of their communities of practice in the organization. Finally, hypothesis H6 predicted that job crafting would have a positive effect on job satisfaction and organizational commitment. Additionally, it was expected that job crafting would negatively influence turnover. Both relational and cognitive crafting had significant positive effects on teachers' job satisfaction and organizational commitment, indicating partial support for hypothesis H6. Although the effects of job crafting on teacher turnover were not significant, task crafting had a large negative effect on turnover, as expected.

It is interesting to note that job crafting, although it significantly influenced job satisfaction and organizational commitment, did not have a significant impact on turnover. A potential explanation for this finding is that other external factors might have played a role in teachers' decisions to stay or leave their schools or the school district. For example, whereas job crafting played a significant role in teachers' job satisfaction and organizational commitment levels, it did not play a significant role in teachers' turnover because other factors, such as few opportunities on the job market, might have played a more decisive role in their decision to stay or leave. Another interesting finding here relates to the effect of professional identification. Teachers who identified more strongly with their profession were more likely to leave their school and the school district. It might have been that these teachers found that their professional goals and values were not met in their schools or the district as a whole, and decided to pursue careers somewhere else.

Table 33 Summary of Hypotheses Testing Results Study 2

Hypothesis	Predicted relationship	Job Crafting			Summary
		Task Crafting	Relational Crafting	Cognitive Crafting	
H1	Discretion → Job crafting (+)	**.159** (supp.)**	.028	**.135** (supp.)**	**Partially supported**
H2	Task complexity → Job crafting (+)	**.025** (supp.)**	.051 Work org. moderates (*)	.001	**Partially supported**
H3	Task interdependence → Job crafting (-)	.075*	.362**	.053	**Not supported**
H4	*Not in Study 2*	-	-	-	**-**
H5	Occupational community of practice → Job crafting (+)	.001	.001 Work org. moderates (*)	.000	**Not supported**
H6	*Job crafting → Affective outcomes (+)* → Job satisfaction (+) → Organizational commitment (+) → Turnover from school (-) → Turnover from district (-)	 .122 .090 -.253 -.237	 **.071** (supp.)** **.061**† (supp.)** .020 .009	 **.179** (supp.)** **.244** (supp.)** -.066 -.090	**Partially supported**
H7	*Not in Study 2*	-	-	-	**-**

** p≤0.01; * p≤0.05; † p≤0.1

8.0 DISCUSSION AND CONCLUSIONS

The main purpose of this research was to study how individuals take action to shape the boundaries of their jobs, by conceptualizing and carrying out tasks, enacting relationships to accomplish work goals, and ascribing meaning and significance to their work. The research also examined the work context factors that influence these job crafting behaviors. More specifically, it examined the organizational structural factors (discretion, complexity, and interdependence) as well as the relational factors associated with work groups or occupational communities of practice that influence individuals' job crafting at work. Finally, the work-related outcomes associated with job crafting for individuals were examined, along with potential implications for work groups and the organization.

This chapter includes a discussion of the results of the hypotheses tests conducted in both studies, as well as the results of the additional analyses performed. Next, it integrates the findings in both settings and draws parallels and contrasts between the two studies. It also outlines the main strengths and limitations of the studies, as well as significant contributions and implications for future research. I conclude with several suggestions for future research in the area and an overall conclusion.

8.1 DISCUSSION OF RESULTS STUDY 1

8.1.1 Discussion

Study 1 examined the work context predictors of workers' job crafting in the context of highly-autonomous teams in manufacturing. The study also examined the effects of workers' job crafting for several outcomes of interest for individuals and the organization – job satisfaction, organizational

commitment, absenteeism levels, and job effectiveness. Study 1 predicted that work discretion and task complexity – two important structural work context elements, would positively influence individuals' job crafting behaviors. In addition, it also predicted that team task interdependence would negatively impact team members' job crafting, while team psychological safety would positively affect individual job crafting. It was believed that work context, both structural and relational, would significantly influence how individuals use the autonomy they have in approaching their work.

As predicted, both work discretion and task complexity positively affected job crafting. Whereas task complexity had a positive and significant effect on all facets of job crafting, work discretion only affected task and relational crafting. One possible explanation for the lack of the expected effect of discretion on cognitive crafting might be the empirical measure that was used for cognitive crafting. As indicated, the measure was based on Hackman and Oldham's (1980) job diagnostic survey items, which were the subject of scholarly debate more recently regarding their low reliability coefficients (Taber & Taylor, 1990; Kulik, Oldham, & Langner, 1988). This might have affected the results of the hypotheses tests in the case of cognitive crafting. Indeed, for study 1, the weakest results among the job crafting facets were obtained for the hypotheses tests involving cognitive crafting. An improved measure of cognitive crafting – with an increased number of items using the same response format rather than three different formats, and including items that capture in more detail the enhanced meaning that individuals might ascribe to their work – would have likely resulted in stronger results for the corresponding hypotheses.

The significant effect of task complexity on crafting suggests that when dealing with more complex task environments, workers were more likely to engage in exploration of novel task approaches and relationships with others outside their workgroups, rather than exploit existing task routines and well-established workgroup interactions (March, 1991).

An interesting additional result was the significant effect of skills on task crafting. The results indicated that workers with broader skills were more likely to craft their tasks, beyond the effects of work context on crafting. In addition, skills moderated the impact of work discretion on task crafting, such that

discretion had a stronger positive effect on task crafting for workers with broader skills than for workers with narrower skills. Thus, the way that workers used the discretion they had was at least as important as the level of discretion they perceived in work. Those workers with broader skills were able to use their discretion more effectively and engaged in more task crafting than those with narrower skills. This finding underscores the critical role of skills in this setting. At Volvo Uddevalla, workers were encouraged to develop broader skills that were used in different parts of the car assembly process. The main reasoning for the introduction of this organizational innovation in car manufacturing – highly autonomous teams – was to give workers opportunities to develop broader skills and use them to continuously improve work routines and processes. Skills were considered an essential element in the work process to be coupled with the increased autonomy granted to workers and teams in carrying out their work. The findings of Study 1 support this idea by suggesting that broadly skilled workers are more likely to use the discretion they enjoy in work to come up with novel task routines and processes.

Tests of the predicted negative effect of team task interdependence on job crafting failed to support the stated hypothesis. Task interdependence with others in the team did not have a significant effect on job crafting. Interestingly, whereas the effect on task crafting - although not significant - was in the predicted direction (negative), the effects on cognitive and relational crafting were in the opposite direction (positive). Although no conclusions should be drawn on non-significant findings, the results for interdependence tend to suggest that interdependence might play an enabling rather than an inhibiting role on job crafting. Additional evidence from Study 2 should help in understanding the intriguing role of interdependence. The lack of significance of the results in the case of team task interdependence might be due to the reduced power of the multilevel analysis using individuals nested in teams and analyzing the effects of team-level variables on individual-level variables. The reduced power was due to a small sample size at the team level of analysis (21 teams). Indeed, additional power analyses suggested that the reduced sample size at the team level is one reason for the lack of significant results in this case. These analyses suggested that a much larger number of teams of the average team size in this study (around 70 teams) would have been needed to achieve enough power for the results to be significant.

It was also predicted that team psychological safety would significantly predict job crafting behaviors. The reasoning was that members of teams with safer psychological climates (e.g., team climates that encourage risk taking and experimentation in work) would feel more comfortable in experimenting with novel routines and interacting with others, since others in the team would be more likely to be supportive and less likely to judge them. Contrary to predictions, team psychological safety had a significant negative effect on relational and cognitive crafting. This suggests that in teams where workers perceived increased psychological safety, they were less likely to reach outside the team and interact with other employees outside the team. Instead, these workers preferred to limit their relationships to carry out work within the team, maybe because the team safety perceptions made them rely to a higher extent on their teammates for task information and advice.

It could also be that the negative relationship between team psychological safety and crafting is attributable to the fact that team members often develop implicit theories about how things should happen in teams (Guzzo & Dickson, 1996). For instance, team members might have inferred that they were asked to report on the level of team cohesion, and thought they were cohesive, because they thought that cohesiveness is related to performance. In other words, if I as a team member interpret the survey questions about team psychological safety as asking about team cohesion, and I think that cohesion is good because it leads to increased team performance, then I am more likely to answer to the questions in a way that reflects higher levels of team cohesion. However, since cohesive teams are more likely to stick together in their actions and thus reduce their level of interaction with outsiders, then the relationship between the team construct intended to be measured (i.e., team psychological safety) but interpreted differently (i.e., team cohesion) and job crafting would be negative.

It was also predicted that job crafting would be positively related to two important affective outcomes for individuals -- job satisfaction and organizational commitment – and would reduce absenteeism levels. In terms of job satisfaction outcomes, while results showed that cognitive crafting did indeed predict satisfaction, task and relational crafting did not have a significant impact on satisfaction. One potential explanation for the lack of significant results might be that workers engaging in more

intensive task or relational crafting experienced more job-related stress because of the increased task and relational demands placed upon them. Thus, increased job stress might have reduced the positive impact of task and relational crafting on job satisfaction. Further, the relationship between cognitive crafting and job satisfaction should be interpreted with some degree of caution, since both measures were collected from the same source.

In terms of organizational commitment outcomes, results were more encouraging than in the case of job satisfaction. Despite the lack of a significant relationship between task crafting and satisfaction, task crafting had a positive effect on organizational commitment. This result is promising, given the fact that the two measures were collected from different sources -- task crafting was a supervisor rating and organizational commitment was a self-report. Further, whereas relational crafting did not have a significant impact on commitment, cognitive crafting had again a significant positive impact. Overall, the results suggest that individuals who engage in behaviors that shape the tasks they perform and the meanings they ascribe to work are more satisfied with their jobs and more committed to their organizations.

The study provides some evidence that job crafting reduces absenteeism levels among workers. Although the negative relationship between job crafting and absenteeism was significant only for the task facet of job crafting, the result is important given the increased interest of management in curbing absenteeism in the work setting explored. Indeed, absenteeism was considered a serious problem in the factory and constituted one of the reasons why the team production system was introduced. It was reasoned that giving workers more autonomy at work would enhance their interest and engagement in work and thus decrease their absenteeism. The results of the study reinforce the general expectation that workers who crafted their tasks more were less likely to be absent from work. The absenteeism finding is even more encouraging given that the relationship between crafting and absenteeism was not artificially inflated due to same source bias -- task crafting was a supervisor measure and absenteeism an objective, archival measure.

It was also predicted that job crafting would positively influence job effectiveness. As predicted, task crafting had a significant positive impact on both quality and efficiency levels. Further, relational crafting had a significant positive effect on efficiency. Thus, workers taking more initiative in shaping their tasks achieved higher levels of quality and were more efficient in their work. Workers who engaged in more relational crafting by interacting more often with others outside their team were also able to improve their efficiency levels. These findings indicate that crafting has positive implications not only for the actor engaging in these behaviors (i.e., positive affective outcomes such as enhanced satisfaction and commitment), but also for organizational performance (i.e., superior quality ratings and enhanced efficiency at work). The positive implications of crafting beyond the individual were also revealed in an additional analysis conducted to examine the effects of crafting on team outcomes. This analysis indicated that teams whose members engaged in more intense task crafting achieved increased productivity levels compared to teams whose members engaged in less intense crafting.

Finally, it is interesting to note how relational crafting impacts job effectiveness. Whereas relational crafting has a significant positive effect on job efficiency, the effect on quality ratings is more nuanced. Indeed, an additional analysis using the two facets of relational crafting indicated that strength and range of interaction had opposite effects on quality. Workers who had stronger (more frequent) interactions with others outside their team achieved higher quality levels. However, the positive effects of strength were offset by the effects of range of interaction – broader networks of interaction hurt employee quality outcomes. Broader networks might have an opposite effect because there usually is a trade-off between an individual's range and strength of interaction with others: individuals building a broader network may not have the time necessary to build strong, frequent interactions with actors outside the team. It might be that the positive effects of strength of interaction on quality were due to the fact that stronger relationships are often characterized by higher levels of interpersonal trust, and thus facilitate collaborative behaviors and the transfer of more complex knowledge (Nahapiet & Ghoshal, 1998; Hansen, Podolny, & Pfeffer, 2001). Thus, stronger relationships with other employee groups might have helped workers in transferring and adopting superior practices and work routines and, as a consequence,

enhance quality. Consistent with prior research on boundary spanning in groups (Ancona & Caldwell, 1992) and occupational and functional boundaries within organizations (Bechky, 2003b; Carlile, 2002), the findings suggest that crossing occupational or functional boundaries in organizations has an important impact on transferring knowledge and improving work practice.

Thus, Study 1 provides evidence that the structural context of work has a strong impact on employees' job crafting. Specifically, discretion and task complexity enable job crafting. The study also highlights the critical role of employee skills in taking opportunities for crafting. Indeed, the study shows that while skills have a direct positive impact on task crafting, they also moderate the impact of discretion on crafting. Workers with broader skills were more likely to use the discretion they had at work to craft their tasks and take more task-related initiatives compared to workers with narrower skills. This finding confirms the general expectation at Volvo Uddevalla that creating opportunities for workers to broaden their skills would have positive performance effects, because workers would use these skills to come up with novel task approaches that improve task performance.

Further, teams have a strong influence on team members' job crafting. Although team task interdependence had no significant effect on individual job crafting, team psychological safety significantly reduced crafting. Thus, the study highlights the importance of considering the relational team context when examining individual job crafting. Whereas giving workers increased opportunities to shape their jobs through more discretion and more complex tasks, having them work in autonomous teams may not necessarily enable more job crafting. The present study suggests that autonomous teams may inhibit individual job crafting, when teams encourage interaction inside the team at the expense of interaction outside the team. The impact of task interdependence on job crafting remains to be explored in more depth in Study 2.

Study 1 also provides evidence that job crafting has important implications for individuals, which can impact team and organizational outcomes. Specifically, task crafting improved both affective outcomes (enhanced organizational commitment and reduced absenteeism) and effectiveness outcomes (enhanced quality and efficiency ratings; improved team productivity). Relational crafting improved

efficiency outcomes; and cognitive crafting had a significant positive effect on affective outcomes (job satisfaction and organizational commitment). These findings highlight that the benefits of job crafting extend beyond the individual actor and can have significant effects on the entities in which the individual is embedded at work (e.g., team, organization).

8.1.2 Strengths and Limitations

Study 1 has several strengths. First, the research setting selected for this study, although being the subject of extensive debates in the literature regarding the learning outcomes associated with worker autonomy (see Adler & Cole, 1993; 1994; Berggren, 1994), was not explored empirically in sufficient detail – especially at the individual and team levels of analysis, where important processes can affect learning and performance outcomes. In this setting, important task knowledge is embedded in the idiosyncratic ways in which individuals carry out their work and in the social interactions among different actors. Thus, the examination of how work is carried out in this setting adds important value to our understanding of job crafting behaviors and their antecedents and consequences in organizations.

A second strength of the study is the use of several different sources from which data were collected. Self-report data were collected using the survey instrument, performance data were collected from supervisors, and absenteeism data were collected from archival information. Team membership information was constructed from archival product build data. Moreover, most of the dependent variables (supervisor ratings, absenteeism data) were collected at a later point in time compared to the independent variables (collected through survey administration), suggesting a causal relationship. Thus, the data collection strategy served to minimize potential issues regarding common method variance in this study.

A third strength of Study 1 is the use of a variety of different statistical techniques to test the hypotheses. In particular, the use of hierarchical linear modeling to test cross-level effects of teams on individuals adds richness to the analyses conducted.

Study 1 also has some limitations, which are outlined below. The first limitation of the study is the setting that was selected. While interesting for the study of job crafting for the reasons discussed

before, caution may be warranted in generalizing any significant findings beyond the organization explored. Because the first study explores only one organizational setting (Volvo's Uddevalla plant), the external validity of the results is considerably reduced. The second study of job crafting addresses this issue by including several organizational settings.

A second limitation of the study is the measure of task crafting. While this measure captures an aspect of how employees craft their tasks, it is limited, because it misses the richness and nuance of the behaviors through which individuals craft their tasks. However, Study 1 provided an interesting and unique context to explore crafting, as well as the motivation to examine crafting in more depth in Study 2. A richer measure of task crafting was developed in Study 2.

A third limitation of Study 1 is the fact that the perceptual independent variables (e.g., discretion in work and task complexity) and some of the dependent variables (e.g., cognitive crafting, job satisfaction) were based on individual, self-reported data. Similarly, the task crafting measure and the individual effectiveness measures are supervisor ratings. Therefore, it is possible that some of the observed relationships between these variables may be artificially inflated due to common method bias.

Another limitation of the current study is the small sample size at the team level, which considerably limits the type of analyses one could perform to explore some of the team-level issues related to job crafting. The small sample size at the team level restricts the power of the hierarchical linear modeling analyses to be performed for testing potential cross-level effects of teams on individuals. Finally, the theory developed in this study suggests a causal direction of relationships between variables. Even though some of the dependent variables were collected at a later point in time compared to the independent (survey-based) variables, causality cannot be tested properly without a longitudinal design.

In conclusion, while Study 1 has some limitations, several steps were taken to minimize the effects of these limitations. In addition, the limitations are offset by several strengths which give the study the potential to make a valuable contribution to both research and practice. These contributions are discussed later, after discussing the results of Study 2.

8.2 DISCUSSION OF RESULTS STUDY 2

8.2.1 Discussion

Study 2 examined the work context predictors of job crafting in the context of professional work. Specifically, it examined job crafting by special education professionals in urban public schools. The study examined the effects of the organizational or structural factors, as well as the effects of professional factors (i.e., occupational community of practice) on teachers' job crafting. Study 2 predicted that work discretion and task complexity – two important structural work context elements in school organizations -- would positively influence special education teachers' job crafting behaviors. In addition, it predicted that task interdependence with others would negatively impact individuals' job crafting, while the strength of the occupational community of practice of special education teachers in the school would positively affect crafting. Finally, the study also examined the effects of special education teachers' job crafting on several outcomes of interest for teachers and their retention in schools – job satisfaction, organizational commitment, and individual turnover.

As predicted, discretion had a significant positive effect on task and cognitive crafting, suggesting that teachers who reported more discretion in their work tailored and expanded their tasks more and ascribed increased meaningfulness to their jobs. Because discretion was measured as individual perceptions, the relationship between discretion and cognitive crafting should be interpreted with some degree of caution, given that both measures were collected from the same source. Because teachers in the current study worked in two distinct forms of work organizations, with different implications for the level of discretion in work, an additional variable capturing the form of work organization was entered into the analyses. While perceived discretion did not have a significant effect on relational crafting, it is interesting to note that work organization had a significant effect on relational crafting. Thus, teachers in collaborative work arrangements engaged in more relational crafting than teachers in isolated, stand-alone work arrangements.

This finding highlights the critical role of work organization in how work is carried out, and suggests that organizations that emphasize collaboration encourage their workers to engage in more relational crafting to better do their jobs. It might be that task and cognitive crafting were determined to the largest extent by individuals' perceptions of discretion in work, because perceptions reflect individuals' integration of their experiences on the job and thus affect how they approach work (Rousseau, 1978; Ashforth & Saks, 2000). In contrast, relational crafting was impacted mostly by the objective form of work organization, because work organization shaped with whom people *could* interact at work, beyond the effect of individuals' perceptions of discretion.

Thus, in the context of professional work, the findings of Study 2 resonate with recent research efforts for understanding the experience of professionals in organizational settings and how organizational structure impacts their work (Adler & Borys, 1996; Perlow, 1998, 2001; Briscoe, 2006).

It was predicted that more complex tasks would predict higher levels of job crafting. Although task complexity did not predict all facets of job crafting, it had a significant positive effect on task crafting. Further, task complexity had a stronger positive effect on relational crafting for teachers in collaborative work arrangements than for teachers in stand-alone work arrangements. Thus, collaborative work organization facilitates teachers' increased reliance on their enacted social networks under conditions of increased task complexity, to get their work done more effectively.

An important problem faced by special education professionals in their daily work is difficult task demands due to the various learning needs of students with disabilities. The findings of Study 2 regarding the forms of organizing in teachers' work suggest that these types of work arrangements facilitate distinct crafting behaviors by teachers, in their efforts to address the difficult task demands they face. Stand-alone work arrangements are conducive to more intense tailoring and expanding of tasks, whereas collaborative work arrangements are conducive to more intense relational crafting by teachers who share responsibilities with their team counterpart. Thus, stand-alone teachers, being more isolated in their workplaces, draw more upon their individual resources by shaping their tasks. In contrast, collaborative teachers, being more integrated at work with the rest of their peers in the organizations, draw more upon

collective resources such as their communities of practice in the organization, by shaping their work-related relationships.

The results for task interdependence as predictor of crafting were surprising. It was hypothesized that special education professionals' interdependence with others at work inhibits their job crafting, but the evidence suggests that interdependence actually enables task and relational crafting. The reasoning for the corresponding hypothesis was based on the increased value that professional workers put on independence at work and the free exercise of their professional judgment and authority in work situations. However, in this study, special education professionals who experienced more interdependence tailored and expanded their tasks more and engaged in more intensive relational crafting. It might have been that special education teachers who were more interdependent crafted their tasks and relationships more because their increased interdependence with others allowed them to develop a broader view and a deeper understanding of the inter-connections between their work and the work of others in the organization, and thus provided more resources (e.g., information, inter-personal trust) that enabled their crafting.

The possibility of reversed causality should also be considered here. It might have been that teachers who engaged in more job crafting developed increased interdependence with others by crafting relationships with others that they then needed to accomplish work. This possibility should not be discarded unless a longitudinal design is used, with job crafting measured at a later point in time than task interdependence.

Further, the findings regarding the impact of occupational communities of practice on special education teachers' crafting deserve more research attention. The strength of the occupational community of practice did not have a direct effect on teachers' job crafting. However, it had a stronger positive effect on relational crafting for collaborative than for stand-alone teachers, suggesting that the impact of the relational context of work is more powerful in settings that emphasize collaboration and information sharing (i.e., collaborative work). It should be noted here that other studies of how work gets done in

communities of practice were also focused on settings employing teamwork and worker collaboration (e.g., Orr's study of copy machine technicians, 1996).

An interesting result related to the impact of the professional context on teachers' job crafting was the significant positive effect of teachers' professional identification on the extent to which teachers imbued their work with increased significance and meaning. It might be that the relational context of work (i.e., occupational community of practice) exerted such a strong influence on teachers' work that it constituted the main driving factor in shaping their relational approach to work. In such a case, professional identification – a cognitive factor – only influenced teachers' beliefs about their work and thus their cognitive crafting. Future research on the relationship between professional identification and job crafting of professional workers should examine this in both "strong" and "weak" organizational contexts (Mischel, 1977), where the impact of other work context variables on job crafting varies from strong to weak. For example, studying physicians' job crafting in both strong settings (e.g., hospitals) and weaker settings (e.g., individual private practice offices) might shed more light on the role of physicians' professional identification on their work approaches.

In terms of outcomes of job crafting, the results of Study 2 highlight the importance of crafting in enhancing job satisfaction and organizational commitment, and therefore in fostering attachment and reducing turnover. Although the effects of task crafting were not statistically significant, the effects were in the hypothesized direction and particularly large (i.e., see the effects of task crafting on job satisfaction and turnover). Task crafting should have the strongest positive effect on performance outcomes such as student achievement – however student achievement data could not be obtained in time for this study.

Finally, although not hypothesized here, the positive effect of professional identification on teacher turnover is interesting to note. It might be that teachers who identified more with the special education profession were more strongly embedded in external networks of peers who provided them with information about potential work opportunities elsewhere. Thus, future research should examine in more depth the simultaneous effects of job crafting and professional identification on individual turnover.

8.2.2 Strengths and Limitations

Study 2 has both strengths and limitations, which are discussed in this section. First, the research setting selected for this study (i.e., urban public schools) is not one that is commonly found in organizational research. However, it represents an interesting setting for developing and testing organizational theories, because of several factors: (1) the on-going efforts to bring about changes to an institution that continues to experience performance declines despite long-standing reform efforts; (2) the variety of stakeholders involved; and (3) the importance of the end product involved – the students – and the highly visible evidence of the failure of the institution to perform up to public expectations. In this setting, important task knowledge is embedded in the idiosyncratic ways in which special education teachers carry out their work in the classroom and tailor and expand instruction for their students, and in the social interactions with other teachers and administrators. Moreover, the work of special education teachers represents a particularly appropriate context to examine job crafting, given the nature of this work. Special education teachers have to deal with multiple, complex demands in their work. Their work is knowledge-intensive and ambiguous, because there is no right way to do the work and teachers need to come up with novel task approaches to carry out their work.

A second strength of the study is the richness of the job crafting measure (particularly the task crafting component), which allows us to better understand teachers' work by looking at what they actually do in their work (Barley, 1996; Barley & Kunda, 2001). Whereas qualitative research would be the most effective way to capture the whole richness of what actually people do in their work (and therefore how they craft their work), the measure of job crafting developed in this study through observations, interviews, and focus group discussion captures to a very high extent the various task strategies that teachers use in crafting their work.

A third strength of Study 2 is the large sample of organizations (school settings) included, which alleviates potential concerns with external validity raised in Study 1. A fourth strength of the study is the use of several different sources from which data were collected. While self-report data were collected

form teachers using the survey instrument, important contextual data were collected from survey administrators, who provided an independent assessment of the contextual variables affecting teachers' job crafting. Thus, the data collection strategy minimized potential issues regarding common method variance in this study.

Finally, another strength of this study is the use of multi-level data analysis techniques (i.e., Hierarchical Linear Modeling) to test hypotheses and partition the variance in the dependent variable across different levels of analysis. The use of HLM was particularly useful in the present study, given that teachers were nested in larger units (i.e., organizations or schools).

Some limitations of Study 2 are outlined next. Although the setting is interesting for the study of job crafting for the reasons discussed before, caution may be warranted in generalizing any significant findings beyond the setting explored (educational setting). Further, the measure of job crafting is context-specific and therefore, in settings other than educational, additional qualitative work should be performed to create a similar measure.

In addition, even though care has been taken to gather data from different sources, perceptual independent variables (e.g., job crafting) and affective outcomes (e.g., job satisfaction, organizational commitment) are based on individual, self-reported data. Therefore, there is a possibility that observed correlations between these variables might have been artificially inflated due to common method bias. However, the fact that the job crafting measure uses different response formats helps in alleviating these concerns. Finally, the theory developed in this study suggests a causal direction of relationships between variables. However, causality cannot be tested properly without a longitudinal design and the use of adequate controls.

In conclusion, while Study 2 has some limitations, several steps were taken to minimize the effects of these limitations. In addition, the limitations are offset by several strengths which give the study the potential to make a valuable contribution to both research and practice. I will discuss these contributions after the next section, which integrates the findings from both studies.

8.3 INTEGRATION OF FINDINGS FROM THE TWO STUDIES

Taken together, the results of the two studies shed light on what job crafting is and its antecedents and outcomes in organizational settings. The influence of two types of factors on workers' job crafting was examined – factors in the structural context of work and factors related to the relational context or to individuals' membership in their relevant work groups or occupational communities. Several broad findings emerged from this analysis.

First, each facet of individuals' job crafting is shaped by distinct factors in the organizational and relational context of work. Whereas structural work context (e.g., discretion in work and task complexity) had the most powerful influence on the task facet of job crafting, the relational context of work (e.g., interdependence, psychological safety, and occupational community of practice, at least for collaborative work) had the strongest influence on the relational facet of job crafting. Further, work identity aspects (e.g., professional identification) seem to have the strongest effect on the cognitive facet of job crafting. Table 34 summarizes the pattern of results emerged from the two studies. Note that the table only shows, for each antecedent factor, the facet of job crafting on which the antecedent had the largest effect.

Second, work organization plays a major role in shaping individuals' engagement in job crafting. In Study 1, all individuals participating were members of autonomous teams, thus comparisons with others working in different work arrangements could not be made. However, the findings suggest that the teams play a critical role in shaping their members' crafting. Individuals who are members of teams with higher levels of team psychological safety tend to limit their crafting to interactions within the team at the expense of interactions across the team's boundaries. Thus, autonomous teams might sometimes become more isolated from external others and thus restrict the transfer of novel ideas, superior work routines and practices across teams. This can influence organizational attempts to transfer best practices from one team to another, and therefore impact in significant ways organizational performance.

Table 34 Pattern of Results Emerging from the Two Studies

Largest effect exerted by…	*Facet of job crafting influenced*		
	Task	***Relational***	***Cognitive***
Structural context Discretion Complexity	√		
Relational context Interdependence Psychological safety Community of practice		√	
Professional context Professional identification			√

Further, in Study 2, the way work is organized has a critical impact on what type of crafting is mostly used by professional employees in their work. The findings suggest that the types of work arrangements facilitate distinct crafting behaviors by special education professionals, in their efforts to address the difficult task demands they face. Stand-alone work arrangements are conducive to more intense tailoring and expanding of tasks, whereas collaborative work arrangements are conducive to more intense relational crafting by teachers who share responsibilities with their team counterpart. Thus, stand-alone teachers, being more isolated in their workplaces, draw more upon their individual resources by shaping their tasks. In contrast, collaborative teachers, being more integrated at work with the rest of their peers in the organizations, draw more upon collective resources such as their communities of practice in the organization, by shaping their work-related relationships. A direct consequence of this finding is that organizations interested in fostering relationships that cut across different functional and occupational groups should introduce structures that enable collaboration among employees.

Third, work organization also shapes the effects of other contextual factors on workers' levels of engagement in job crafting. Results of Study 2 indicate that when facing more complex tasks, special education professionals in collaborative work arrangements are more likely to engage in more intense relational crafting than those in stand-alone work arrangements. Further, the impact of workers'

communities of practice in organizations on their members' relational crafting was also moderated by the type of work organization in place. Compared to stand-alone work arrangements, collaborative forms of work organization allowed teachers to draw more on their communities of practice within the organization to craft relationships to better accomplish work. A direct implication of this finding is that organizations can tap into the hidden value of communities of practice formed within their boundaries by introducing work arrangements that foster collaboration among workers rather than isolation of workers.

Fourth, the studies indicate that job crafting has important consequences not only for the focal actors who craft their jobs, but also for the teams and the organizations in which they work. Both studies show that job crafting has positive implications for individual well-being in organizations, by boosting employees' job satisfaction. The studies also show that the effects of job crafting extend beyond the focal individual and affect outcomes that are relevant for organizational performance. Job crafting enhances organizational commitment levels, while reducing absenteeism among employees, and thus can serve as a way to increase attachment and retain valuable employees. Finally, job crafting impacts directly organizational performance, by increasing individual effectiveness and boosting team productivity.

8.4 RESEARCH CONTRIBUTIONS

This research makes several contributions to the organizational literature. The research contributes to the emerging literature on job crafting in several ways. First, the dissertation develops a model of job crafting in the workplace that takes into consideration the influence of factors in the context of work – structural, relational, and occupational. Previous work has focused mostly on the individual differences that might drive job crafting (e.g., motivation orientation, Wrzesniewski & Dutton, 2001). The results of the study suggest that the context work plays an important role in shaping how people approach their work. Structural factors, such as discretion and complexity, along with relational factors related to work groups and occupational communities of practice significantly affect individuals' job crafting behaviors.

Second, this research adopts a multifaceted approach to how people shape their work, whereas most of the previous work on similar phenomena explored only one boundary of the job (e.g., tasks, Staw & Boettger, 1990; relationships, Fletcher, 1998). The results of the research inform the emerging job crafting literature by exploring not only how people shape the task boundaries of their work, but also the relationships to carry out their work – the relational facet of job crafting. This is an area where there is little prior research, yet it has important implications for the burgeoning theoretical and empirical work examining how knowledge diffuses across different individuals and work teams in organizations (Szulanski, 1996; Hansen, 1999) and the role of informal networks in achieving organizational effectiveness and innovation (Hargadon & Sutton, 1997; Tsai & Ghoshal, 1998; Nahapiet & Ghoshal, 1998; Adler & Kwon, 2002; Hansen, 2002).

Third, this research examines job crafting empirically, whereas previous work is mostly theoretical, and the few empirical undertakings are grounded in qualitative work. I used qualitative methods to enrich our understanding of job crafting in the context of work and developed a rich measure of job crafting that I tested using surveys. Fourth, this research enriches the job crafting literature by providing a multi-level examination that takes into account not only the individual level influences but also the collective-level forces that shape people's work.

This research also informs our understanding of what people do in their work, answering to numerous calls from scholars to open the "black box" of what work is about, and the role of individual workers in shaping work (Barley, 1996; Barley & Kunda, 2001). The studies offer a rich examination of the ways in which employees take initiative in shaping the task, cognitive, and relational boundaries of their work. One of my goals in undertaking this research was to extend our understanding of how people craft their jobs when the tasks are not well specified, and the crafting that takes place when there are organizational efforts to structure work.

Further, this research also contributes to the study of professional employees in organizations, by providing a rich analysis of how these workers use job crafting to deal with complex and multiple task demands. The approach taken here considers both the organizational and the professional context of work,

and thus provides a richer examination of context (Rousseau & Fried, 2001; Johns, 2001 , 2006). In this way, it highlights an important avenue for motivating and retaining professional workers in organizations. For the broader literature on work, this research provides a rich examination of how a specific category of professionals, critical to the success of their organizations – special education teachers in public schools – approach and shape their work.

Finally, while the focus of the studies was on individual crafting behaviors, the work context factors that shape these behaviors, and the resulting individual outcomes, the value of this research's contribution to the literature is partially build upon the belief that individual job crafting behaviors represent a potentially valuable resource to the organization. In Study 1, individuals' task crafting initiatives and their relational crafting, through frequent interactions with others outside the team, contributed to increased individual effectiveness, more attachment to the organization, and reduced absenteeism -- all important outcomes for the organization. The value of crafting was realized for the organization through the creation of novel, superior task routines and the transfer of these routines across individuals and teams. In Study 2, employees' crafting contributed to increased attachment to the organization – an outcome with important impact on retention. The value of crafting was also realized for the organization through the development of practices (i.e., tailoring and expanding tasks) that address the complex task demands and support the learning of the beneficiaries of teachers' work.

8.5 FUTURE RESEARCH

In terms of future research, there are several potentially interesting avenues to extend work in this area. First, future research on job crafting may benefit from the adoption of a longitudinal perspective and the exploration of how individuals craft their jobs as they progress from newcomers to long-tenured employees. This type of analysis would allow a better understanding of the complexity of job crafting and how it unfolds over time.

Further, this research has provided some evidence that the collective context of work influences individuals' job crafting behaviors. Future research may explore in more depth the influence of teams on individual job crafting, by exploring contexts with a larger number of teams, to ensure a large enough sample size at the team level, and contexts with more stable teams. Moreover, this research was conducted in settings where there are strong structures in place to standardize work (i.e., the case of special education professionals in urban public schools). In order to better understand the impact of professional communities of practice on their members' job crafting, future research should also consider settings where organizational contexts are weaker such that the impact of occupational communities of practice on job crafting is better revealed. Understanding the overlapping influences of organizational and occupational contexts on individuals' job crafting can further enhance our knowledge of what makes individuals approach their work and shape the multiple boundaries of their jobs in different ways, with important consequences for the focal individual and for others affected by their work.

It would be also interesting for future research to explore to what extent job crafting is an individual- versus a collective-level phenomenon. Ethnographic studies of work have already provided initial evidence that collectives such as communities of practice craft their work as a collective actor (Orr, 1990; 1996). Individuals participate in multiple and often overlapping collectives such as workgroups or occupational communities, therefore I suggest that an exploration of how workers craft together their jobs is worth pursuing in future research.

8.6 PRACTICAL IMPLICATIONS

From a practical standpoint, this work has important implications for managers. A first practical implication of this research is that individual job crafting behaviors may boost job satisfaction. Moreover, job crafting behaviors may lead to superior supervisor performance ratings. Second, the research has implications for organizational practice by providing direction regarding which work context factors enable job crafting and how management can promote these behaviors for the organization's benefit. For

instance, the findings inform organizational practice on how discretion can have the most powerful effect on task innovation, by showing that discretion works better for broadly skilled workers than for those with narrower task skills. Similarly, for organizations dealing with complex tasks and interested in diffusing best practices across individuals and teams, collaborative work arrangements should be preferred to structures that encourage isolation at work.

Third, for team-based organizations, the research suggests that team autonomy – coupled with team climate – may impact performance levels and the transfer of superior work routines across individuals and teams. Because some teams may become isolated and inward-oriented in highly-autonomous environments, managers should take appropriate measures to ensure that alternative mechanisms to transfer superior work routines and best practices from high-performing teams to low-performing teams are in place.

Fourth, this research has implications for retaining employees in organizations. The job crafting perspective highlights an important avenue for motivating and retaining valuable employees in organizations. Facing the reality of increased mobility on the job market for many workers, and in particular for professional employees, managers should recognize job crafting as a tool that can boost workers' motivation, engagement in work, and attachment to the organization, and therefore can contribute to their retention in the organization.

Finally, the job crafting perspective has broader practical implications for organizations interested in bringing about change and innovating. Individuals' job crafting behaviors represent an untapped resource in many organizations, constituting a potential bottom-up capability of organizations to change and improve, as work evolves.

8.7 CONCLUSION

Job crafting is a concept recently developed in the organizational literature. Although it is a prevalent phenomenon in all types of jobs, only recently have researchers started to recognize the relevance of job crafting and its important implications for individuals and organizations. Given the importance of this phenomenon and the relatively scarce research existent on this topic, it is important to develop a better understanding of what job crafting means, the work context factors shaping it, and the individual and organizational outcomes associated with it.

This research examined job crafting behaviors in two different organizational settings, the factors in the work context that shape these behaviors, and the individual outcomes, as well as the organizational implications of job crafting. The findings showed that job crafting captures (1) behaviors that individuals use to customize and expand the boundaries of their tasks, (2) the strength and range of relationships that people they engage in to carry out their work, and (3) the meanings and significance they attach to work. In contrast to previous literature suggesting that these behaviors can be shaped by individual differences (e.g., individual motivations and needs), a complementary perspective was adopted here to explore the influence of work contexts on job crafting.

The findings suggest that work contexts play an important role in shaping job crafting behaviors. Workers who experience more discretion in work and increased complexity in their tasks engage in more job crafting. Further, increased task interdependence with others at work enables job crafting. The relational context of work shapes further individuals' job crafting. In settings utilizing autonomous team work, teams with higher psychological safety limit their members' job crafting. In settings where occupational communities of practice develop inside organizations, these communities foster their members' job crafting to the extent that organizational structures enable collaboration among individuals.

Finally, this research shows that job crafting significantly predicts important outcomes for individuals (e.g., higher job satisfaction and better performance ratings by supervisors) and for organizations (e.g., enhanced organizational attachment, lower absenteeism, and superior job

performance). There was also preliminary evidence that workgroups can benefit from their members' job crafting, as suggested by higher team productivity.

In sum, the findings suggest that job crafting is an important phenomenon observed in many organizations and different types of jobs. This research suggests that workers in various occupations and organizational settings make use of the discretion they have at work to create different jobs for themselves – jobs that allow them to draw on their unique skills, experiences, and leverage their individual motivations and conceptions about work. Thus, although jobs are generally designed to elicit specific desired behaviors from individuals performing them, in reality people in similar jobs talk about their jobs in different ways and do different things at work to get their jobs done.

An important lesson we learn from this research is that job crafting may be an important part of work for many individuals, as it helps them find increased meaning in work and be more attached to what they do at work. Thus, job crafting may play an adaptive function for many individuals, because it helps them find a better fit with the demands of work. The findings suggest that there is a lesson here for organizations too. As the need for change and innovation becomes more prevalent in many organizations, organizations may benefit from increased attention to how people's job crafting can represent an important bottom-up capability to change and improve work processes. Organizations can also benefit from learning how job crafting can be an important resource in retaining valuable employees, by helping people find increased meaning in work and enhancing their motivation and engagement in work.

APPENDIX A

MEASURES USED IN STUDY 1

Discretion *(adapted from Jehn, 1995)*

Scale anchors: 1 = Strongly disagree and 5 = Strongly agree

1. I have a lot of autonomy in solving production-related problems
2. I have freedom to explore new ways to improve the vehicle building process
3. I am able to experiment with new techniques or tools in assembling the vehicle
4. I determine the sequence in which I assemble my components on the vehicle
5. I am not able to deviate from a set process as I perform my assembly tasks (R)
6. There is a specific "right way" to do things in my job (R)

Task complexity *(adapted from Hackman & Oldham, 1975)*

Scale anchors: 1 = Very little and 7 = Very much (items 1 & 4); 1 = Very inaccurate and 7 = Very accurate (items 2, 3, 5, & 6)

1. How much variety is there in your job? That is, to what extent does the job require you to do many different things at work, using a variety of your skills and talents?
2. The job requires me to use a number of complex or high level skills
3. The job is quite simple and repetitive (R)
4. How much uncertainty is there in the way you go about doing your job? That is, to what extent are you unable to predict if a particular procedure or technique is going to work or not?
5. Much of the work on this job requires a "trial and error" approach
6. I often have to try a lot of different things on this job before I can figure out what works best

Work group task interdependence *(Campion, Medsker, & Higgs, 1993)*

Scale anchors: 1 = Strongly disagree and 5 = Strongly agree

1. I cannot accomplish my tasks without information or materials from other members of my team
2. Other members of my team depend on me for information or materials needed to perform their tasks
3. Within my team, jobs performed by team members are related to one another

Work group psychological safety *(Edmondson, 1999)*

Scale anchors: 1 = Strongly disagree and 5 = Strongly agree

1. If you make a mistake on this team, it is often held against you (R)
2. Members of this team are able to bring up problems and tough issues
3. People on this team sometimes reject others for being different (R)
4. It is safe to take a risk on this team
5. It is difficult to ask other members of this team for help (R)
6. No one on this team would deliberately act in a way that undermines my efforts
7. Working with members of this team, my unique skills and talents are valued and utilized

Task crafting

Scale anchors: 1 = Poor, 5 = Outstanding

Supervisor rated task initiative

Relational crafting

Scale anchors: 1 = Never and 7 = Multiple times per day

How often did you have substantive work-related interactions in the past month with:

1. Material handling employees
2. Members of other teams in my area
3. Employees from engineering
4. Employees from maintenance

Cognitive crafting *(adapted from Hackman & Oldham, 1975)*

Scale anchors: 1 = Not at all significant; the outcomes of the work are not likely to affect anyone in any important way and 7 = Highly significant; the outcomes of the work can affect other people in very important ways (item 1); 1 = Very inaccurate and 7 = Very accurate (items 2 and 3)

1. In general, how significant or important is your job? That is, are the results of your work likely to significantly affect the lives or well-being of other people?
2. This job is one where a lot of other people can be affected by how well the work gets done
3. The job itself is not very significant or important in the broader scheme of things (R)

Job satisfaction *(Judge, Bono, & Locke, 2000); Brayfield & Rothe, 1951)*

Scale anchors: 1 = Strongly disagree and 5 = Strongly agree

1. I feel fairly satisfied with my present job
2. Most days I am enthusiastic about my work
3. Each day at work seems like it will never end (R)
4. I find real enjoyment in my work
5. I consider my job to be rather unpleasant (R)

Organizational commitment *(adapted from Meyer & Allen, 1997)*

Scale anchors: 1 = Strongly disagree and 5 = Strongly agree

1. I would be very happy to spend the rest of my career at Volvo Uddevalla
2. I enjoy discussing Volvo Uddevalla with people outside it
3. I really feel as if Volvo Uddevalla's problems are my own
4. I think I could really become as attached to another company as I am to Volvo Uddevalla (R)
5. I do not feel like "part of the family" at Volvo Uddevalla (R)
6. I do not feel "emotionally attached" to Volvo Uddevalla (R)
7. Volvo Uddevalla has a great deal of personal meaning for me
8. I do not feel a strong sense of belonging at Volvo Uddevalla (R)

Effectiveness

Supervisor rated quality and efficiency
Absenteeism (archival data)

Age

Scale: open ended

Gender

Male, Female

Education

Some high school; High school; Technical training; College; Master's degree or beyond

Experience

Time in current job (years)

Skills

Archival records of historical supervisor ratings of a broad set of skills for the car assembly process

APPENDIX B

MEASURES USED IN STUDY 2

Discretion *(adapted from Jehn, 1995)*

Scale anchors: 1 = Strongly disagree and 5 = Strongly agree

1. I have a lot of autonomy in solving teaching-related problems
2. I have freedom to explore new ways to improve the teaching process
3. I am able to experiment with new methods or materials in teaching my classes
4. I determine the sequence in which I teach specific components of the curriculum
5. I am not able to deviate from a set process when I teach (R)
6. There is a specific "right way" to do things in my job (R)

Task complexity *(calculated as linear index)*

1. What types of disabilities do students you currently teach have? (Please check all that apply) :
   Learning disability
   Mental retardation
   Emotional disturbance
   Visual impairment including blindness
   Hearing impairment including deafness
   Speech or language impairment
   Orthopedic impairment
   Autism
   Traumatic brain injury

2. Do any of the students you currently teach have multiple disabilities?
   Yes, No

3. Do you currently teach one grade or more than one grade?
   One grade; More than one grade

Task interdependence *(adapted from Campion, Medsker, & Higgs, 1993)*

Scale anchors: 1 = Strongly disagree and 5 = Strongly agree

1. I cannot accomplish my work without information or materials from other teachers in this school

2. Other teachers in this school depend on me for information or materials needed to perform their jobs
3. Within this school, jobs performed by teachers are related to one another

Occupational community of practice *(calculated as agreement on beliefs among teachers; adapted from Ross et al., 2003)*

Scale anchors: 1 = Strongly disagree and 5 = Strongly agree

1. It is not very productive for students to work together during math time. (R)
2. Creating rubrics for math is a worthwhile assessment strategy
3. A lot of things in math must simply be accepted as true and remembered (R)
4. Using computers to solve math problems distracts students from learning basic math skills (R)
5. If students use calculators they won't master the basic math skills they need to know (R)
6. You have to study math for a long time before you see how useful it is (R)
7. I like to use math problems that can be solved in many different ways
8. When two students solve the same math problem correctly using two different strategies I have them share the steps they went through with each other
9. I tend to integrate multiple strands of mathematics within a single unit
10. I often learn from my students during math time, because my students come up with ingenious ways of solving problems that I have never thought of
11. I encourage students to use manipulatives to explain their mathematical ideas to other students
12. When students are working on math problems, I put more emphasis on getting the correct answer than on the process followed (R)
13. I don't necessarily answer students' math questions, but rather let them puzzle things out for themselves
14. Every child in my classroom should feel that mathematics is something he/she can do
15. In my class it is just as important for students to learn data management and probability as it is to learn multiplication facts

Task crafting

Scale anchors: 1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Most of the time, and 5 = For all math sessions

How often do you use each of the following in your math classes:
1. Teach concepts in small steps that are more manageable for some students
2. Provide shorter problems or fewer assignments for some students
3. Allow extra time for some students to complete tasks
4. Use a highlight marker to identify key words for some students
5. Tape record materials or tests for some students
6. Focus more on organizational skills with some students
7. Assign a classmate as a learning buddy to some students
8. Use flexible grouping to meet individual student needs
9. Use more than one type of homework in the same math class
10. Have different performance expectations for students in the same math class
11. Use various multi-sensory means to teach a concept to some students
12. Use supplemental/different curriculum materials to individualize math instruction for some students

13. Share your own mental processes that you use to solve problems with students
14. Use your own math games for students
15. Use songs you wrote to help students recall math facts
16. Use math resources you found on the internet
17. Use math materials you purchased with your own money

Relational crafting

In an average month, about how many times do you talk to [peers] about math instruction?
Peer categories:

Other teachers at grade level
Other teachers not at grade level
Administrators
Other special education teachers
Other people in school
Other people outside the school

Cognitive crafting *(adapted from Hackman & Oldham, 1975)*

Scale anchors: 1 = Strongly disagree and 5 = Strongly agree

1. My job is very significant and important – the results of my work are likely to significantly affect the lives or well-being of other people
2. This job is one where a lot of other people can be affected by how well the work gets done
3. The job itself is not very significant or important in the broader scheme of things (R)

Job satisfaction

Scale anchors: 1 = Very dissatisfied and 5 = Very satisfied

To what extent are you satisfied or dissatisfied with these aspects about your job:

1. Personal gratification you feel from doing your job
2. Your immediate co-workers
3. Your job overall

Organizational commitment *(Bryk & Schneider, 2002)*

Scale anchors: 1 = Strongly disagree and 5 = Strongly agree

1. I wouldn't want to work in any other school than the one I do now.
2. I would recommend this school to parents seeking a place for their child.
3. I usually look forward to each working day at this school.
4. I feel loyal to this school.

Age

Under 25 years old; 25-34; 35-44; 45-54; 55-64; 65 or over

Gender

Female, Male

Skills

Skill tests selected from University of Michigan teacher testing items

Experience

Including this school year, how many years have you been teaching?
Less than 1 year; 1 year; 2 years; 3 years; 4 years; 5 years; 6-10 years; 11-15 years; 16 or more years

Training

How many hours of math-related professional development have you received? (over the past summer and current school year)

Work organization

Which of the following best describes your current teaching situation?
Special education teacher in collaborative team
Special education teacher in self-contained class
Special education teacher support services

Grade level *(dichotomous coding – grades subject to standardized testing vs. grades not subject to standardized testing)*

What grade do you currently teach?
Pre-Kindergarten; Kindergarten; 1st grade; 2nd grade; 3rd grade; 4th grade; 5th grade; 6th grade

Class size

How many students are in your class?

Presence of paraprofessional

Do you have a paraprofessional in your class?
Yes, No

APPENDIX C

ILLUSTRATIONS OF TASK STRATEGIES USED BY SPECIAL EDUCATION TEACHERS

Adapt tasks by modifying curriculum

Break down tasks in smaller steps

Give more manipulatives (because visual aspect is key in triggering learning)

Post step-by-step directions all over the room

Use color coding of numbers

Use different games adapted to student needs

Reteach lesson/teaching point or reinforce basic concepts for some students in small groups or individually

Share mental processes used in solving problems with students

Pair students one stronger and one weaker

Use shared reading with overhead

Differentiate homework requirements

Differentiate testing

Use three different types of homework in same class

Put everything in a story to enable learning of complex facts (i.e., create practical lesson for life, use money as example)

Use a song to connect a teaching point or remind something learned before

Use calculator when not supposed to, for students with very low ability

Go around the class and teach lesson at each table

Give students cues and graphic organizers

Go through material step-by-step instead of all at once

Use different expectations in response (getting exposure to general curriculum instead of achieving competence is more appropriate for some students)

Use three learning groups and rotate students across three tables to learn different strategies for multiplication

Give more difficult tasks to stronger students

Help students with organizing before leaving (when students have poor organizing skills)

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